User Manual
SIU-DL DataLogger

Revision 3.20.1

Revision List

Revision	Date	Chapter	Description
3.20.1	08-09-17		Match firmware release 3.20

Preface

The data and illustrations found in this document are not binding. We reserve the right to modify our products in line with our policy of continuous product development. The information in this document is subject to change without notice and should not be considered a commitment by Carlo Gavazzi AB. Carlo Gavazzi AB assumes no responsibility for any errors that may appear in this document.

The document uses following pictures to get the reader's attention:

Symbol	Description
	Additional information for how to verify settings and how get the most out of SIU-DL
	Note! Important information to avoid configurations that can cause problems and therefore should be read carefully.

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Warranty and support

To obtain fast and simple support for your SIU-DL, please use our Internet support service at http://www.support-carlogavazzi.se. Here you will find the latest documentation, configuration utilities, drivers etc. You can also contact our support at support@carlogavazzi.se.

Terminology

Term	Extract	Description
TCP/IP	Transmission Control Protocol/ Internet Protocol	TCP (Transmission Control Protocol) is a set of rules used along with the Internet Protocol (IP) to send data in the form of message units between computers over the Internet.
HTTP	Hyper Text Transfer Protocol	HTTP is a set of rules for exchanging files (text, graphic images, sound, video, and other multimedia files) on the Web.
DHCP	Dynamic Host Configuration Protocol	DHCP is a standard protocol that automates the process of configuring network hosts by allowing hosts to obtain IP addresses and configuration parameters
Gateway		A device that makes it possible to transfer data between networks of different kind, e.g. Modbus/RTU and Modbus/TCP.
Template		Describes a Modbus slave device, as a collection of groups and parameters.
Device		A Modbus slave unit that is connected to the SIU-DL.

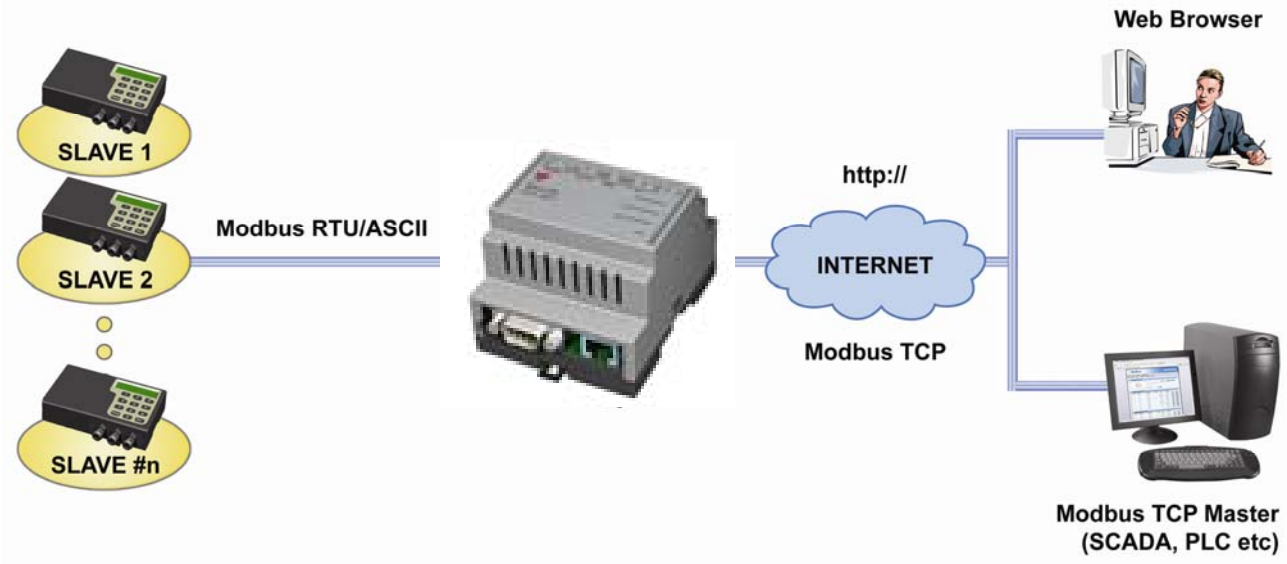
1 About the SIU-DL DataLogger

1.1 General

The SIU-DL DataLogger provides a web-based user interface for accessing data from connected instruments as well as local data-logging and alarm management without using a PC. The SIU-DL DataLogger module acts as a bridge from Modbus TCP to Modbus RTU, making it possible for a Modbus TCP based controller to connect with Modbus RTU based devices.

Some DataLogger features

- Graphical user interface that is easy to work with.
- Support for device templates to allow easy and flexible management of configurations.
- Advanced modem handling, with support for GSM/GPRS modems as well as analogue (PSTN) modems.
- Improved alarm handling, now with alarm history and SNMP support.
- Language support.
- Support for sending log-files with email or FTP.

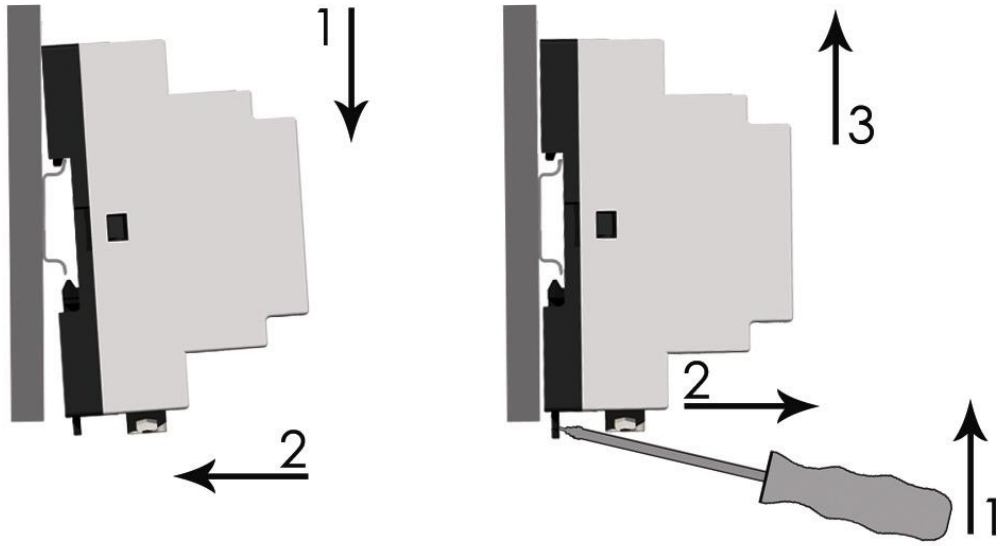


SIU-DL DataLogger supports an RS-232 connection through a 9-pole DSUB or RS-485 (screw connection). It also supports 10/100Mbps Ethernet through a standard Ethernet connector (RJ-45).

It can be configured via a user-friendly web-interface or by using the SIU-DL Config utility (available at http://www.gavazzi.se/siu).

1.2 Mounting

A – Snap on **B – Snap off**



1 – Snap the SIU-DL on to the DIN-rail (as described on picture A above).

2 – Connect the Ethernet cable to the RJ45 connector.

3 – Connect the ModbusRTU network to the DSUB connector (RS-232) or the screw connector (RS-485).

4 – Connect the Power Supply and apply power.

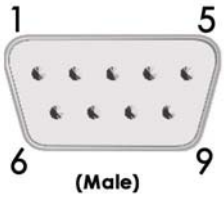
5 – Now you can start using the Gateway. Use the “SIU-DL Config utility” to configure the IP address and other network settings. See section 2.1 Configure the SIU-DL IP-address on page 12 for further information.

The default IP address of the SIU-DL is 10.200.1.1
Please change this IP-address to a valid address in your network. Also, make sure not to power up more than one network attached SIU-DL before IP-address is changed or DHCP enabled.

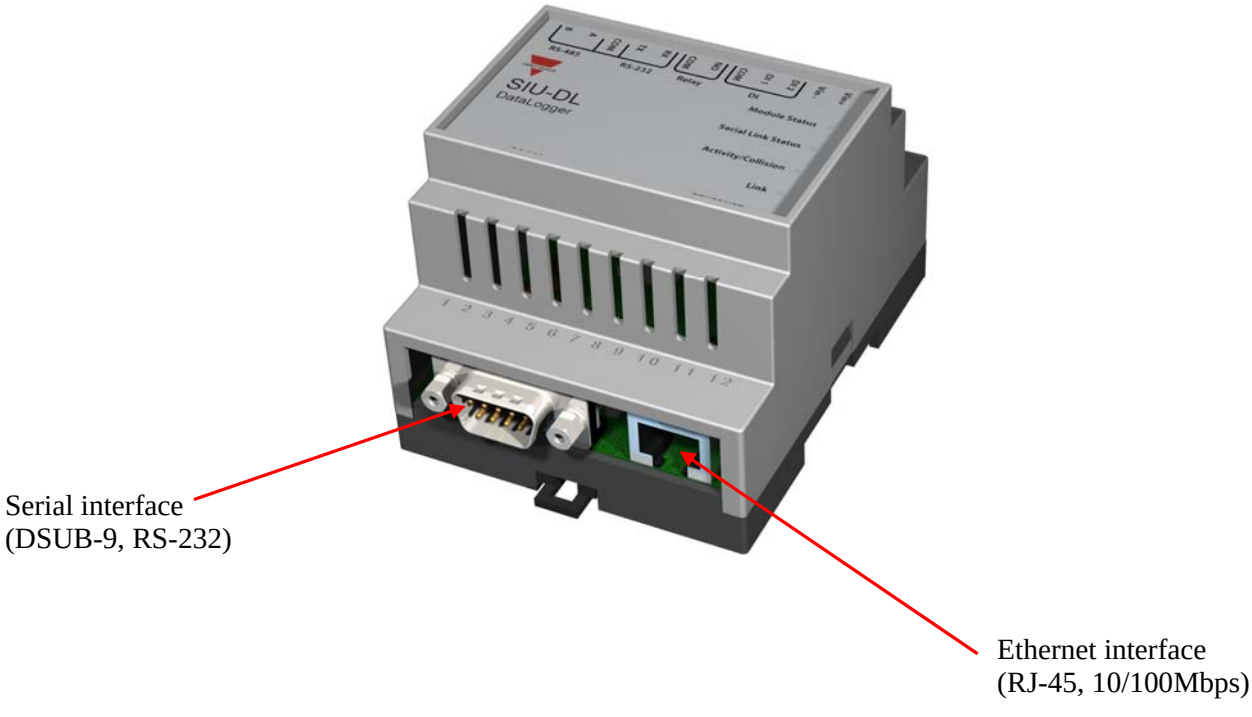
1.3 Connectors

1.3.1 ModbusRTU or Modem interface, RS-232

The 9-pole DSUB, male connector on the SIU-DL unit contains an RS-232 interface. This port can be used to connect to any equipment with an RS-232 interface.

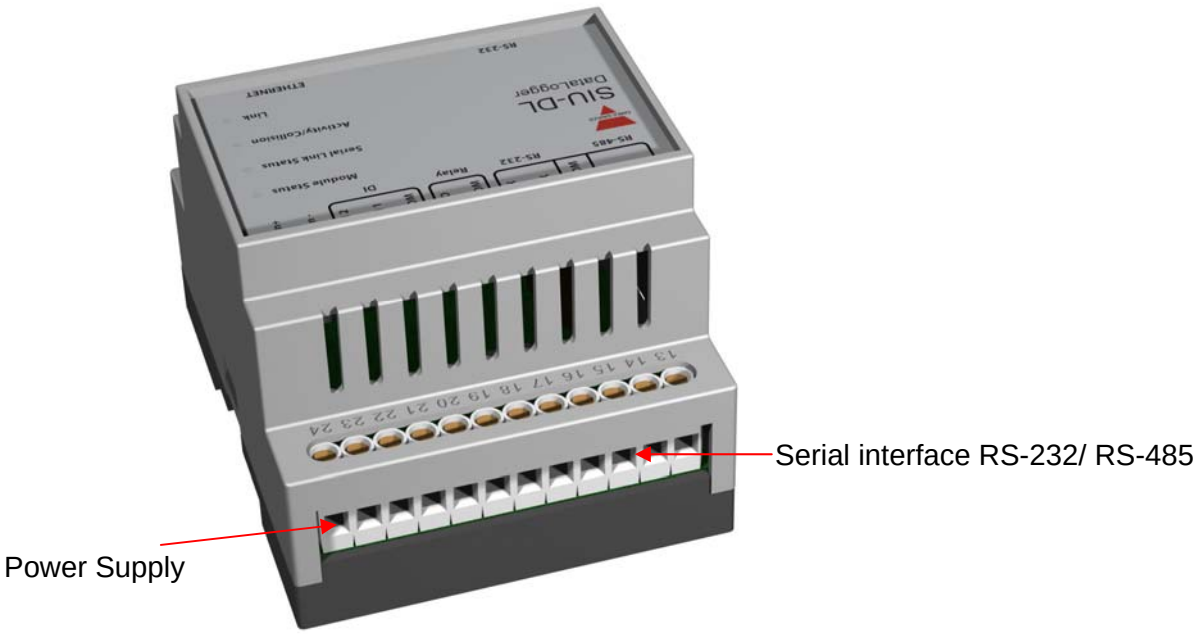


Pin number	Function
1	CD (Carrier Detect)
2	Rx (Receive)
3	Tx (Transmit)
4	DTR (Data Terminal Ready)
5	GND
6	DSR (Data Set Ready)
7	RTS (Request To Send)
8	CTS (Clear To Send)
9	RI (Ring Indicator)



1.3.2 Ethernet interface

The Ethernet interface supports 10/100Mbps, using a standard RJ-45 connector.



1.3.3 Power supply connection

The SIU-DL can be powered by a 9-28VAC/DC supply (Power requirement 2W).

1.3.4 Digital inputs

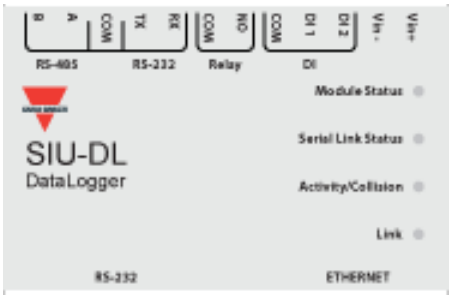
The digital inputs are opto-isolated, and can accept a **10-24VDC** signal for logic HIGH input.
For logic LOW the voltage should be in the range **0-2VDC**.

The status of the inputs can be read in the Gateway Internal Registers (if enabled).
See section 5.2.1 Internal Registers on page 39 for more information.

1.3.5 RS232/RS485 interface

Pin number	Function
24	Vin+
23	Vin- (Ground connection)
22	Digital input 2+
21	Digital input 1+
20	Digital input Common
19	No Connect
18	No Connect
17	RS-232 Receive (Input)
16	RS-232 Transmit (Output)
15	Common
14	RS-485 Line A
13	RS-485 Line B

1.4 LED Indicators



LED description

Name	Colour	Function
Module Status	OFF	No power
	Green	Module is running in normal mode
	Orange	During boot-up
Serial Link Status	Flashing Green	Serial Packet receive
	Flashing Red	Serial Packet transmit
	Orange	During boot-up
Ethernet Activity/Collision	Flashing Green	Ethernet Packet received
	Flashing Red	Ethernet Collision detected
Link	OFF	No Ethernet Link detected
	Green	Ethernet network detected, 10Mbps
	Orange	Ethernet network detected, 100Mbps

2 Getting started

2.1 Configure the SIU-DL IP-address

2.1.1 About the SIU-DL Config utility

The SIU-DL Config utility is a PC-based configuration utility to set TCP/IP network settings in the SIU-DL. This utility has the ability to scan the Ethernet network for connected SIU-DL devices and let the user set IP-address, net mask, gateway, DNS and hostname for each unit.

2.1.2 Installation

System Requirements

- Pentium 133 MHz or higher
- 5 Mb of free space on the hard drive
- Win 95/98/ME/NT/2000/XP
- Network Interface Card (Ethernet)

Installation Procedure

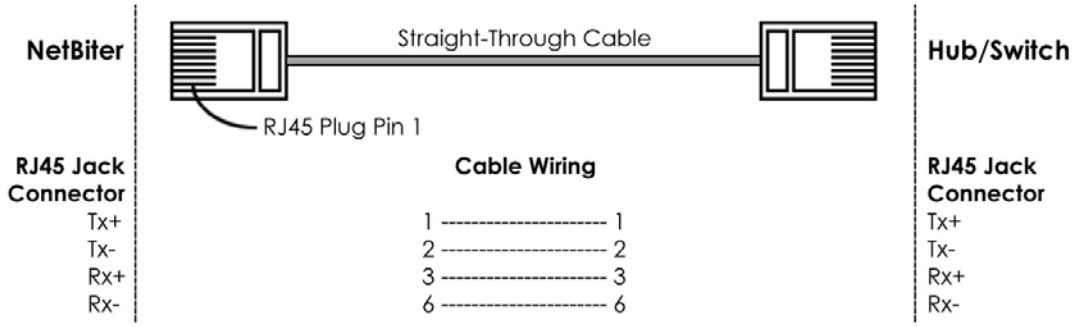
There are two methods to install the **SIU-DL Config utility**; either download it from the Carlo Gavazzi website or use the installation CD-ROM.

- Using the CD-ROM: Run “Setup-SIUDLConfig.exe” and follow the instructions.
- From website: Download the self-extracting installation package “Setup-SIUDLConfig.exe” from http://www.support-carlogavazzi.se/ search on keyword “SIU-DL” and run it.

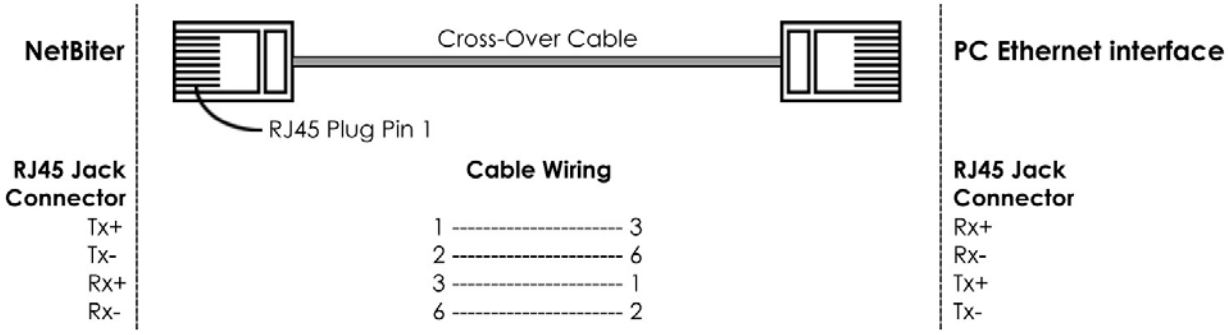
2.1.3 Scanning for connected devices

First ensure that you have connected the SIU-DL units you want to install on the same Ethernet network as the PC is connected to. Use standard Ethernet cables, straight-through or crossover cable depending on how you connect to the device. See pictures below for details.

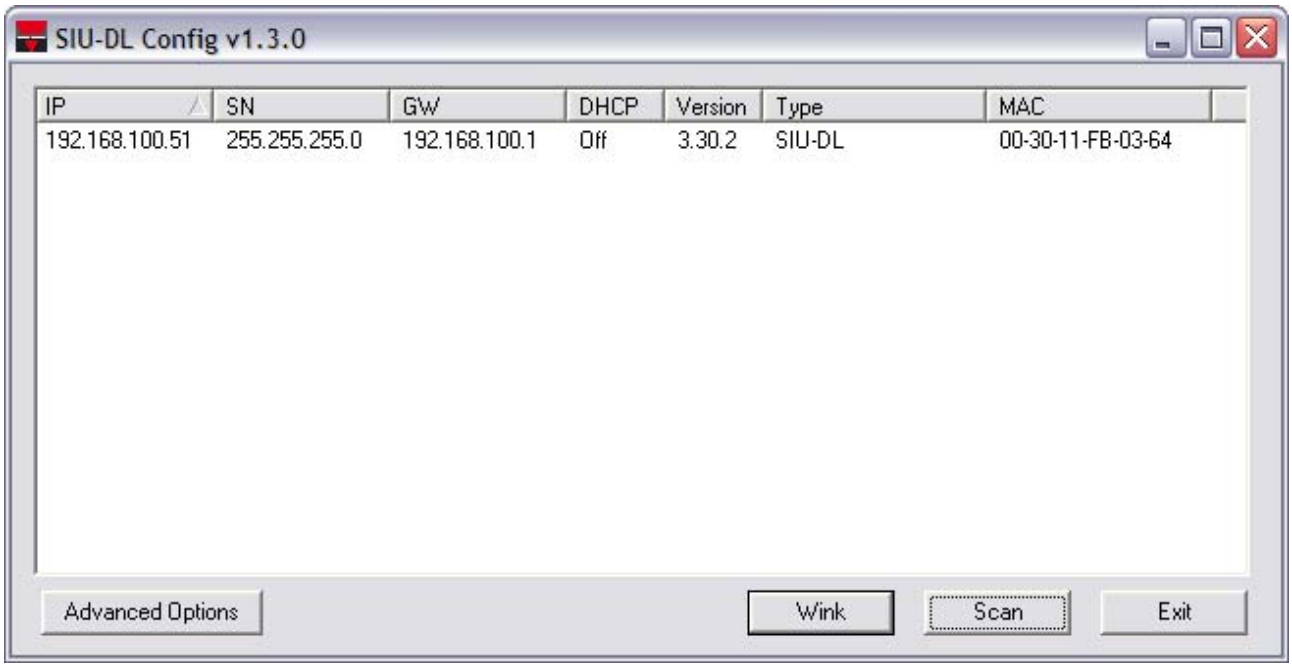
Connecting the SIU-DL to a hub or Switch



Connecting the SIU-DL directly to a PC



When the SIU-DL Config utility is started, it will scan the Ethernet network for SIU-DL devices. All detected devices will be presented in a list in the main window. If you want to force a new scan for devices, you can press the "**Scan**" button.



IP - The IP address of the SIU-DL

SN - The subnet mask

GW - The default gateway

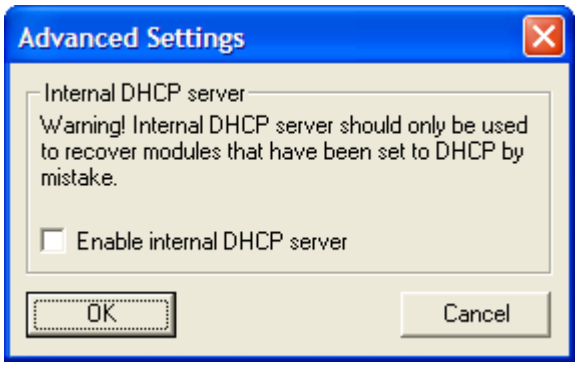
DHCP - Dynamically assigned IP address On/Off

Version - Firmware version

Type - Product type (DataLogger-Modbus)

MAC - The Ethernet MAC address

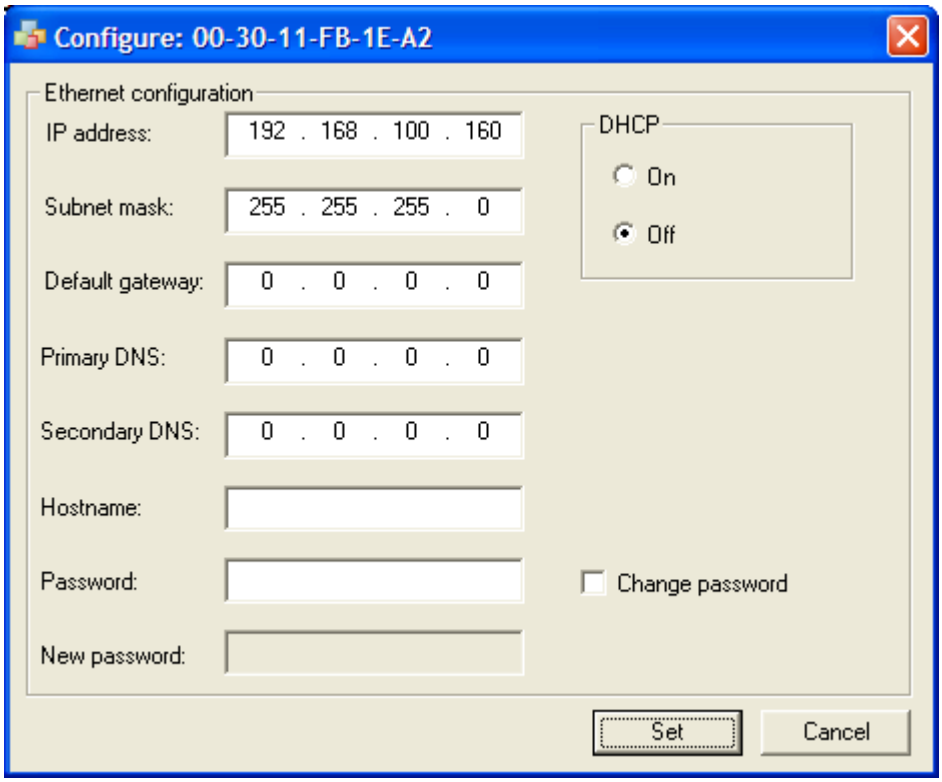
Use the "Advanced Options" button to enable the SIU-DL Config DHCP Server. This is useful when you have set DHCP to "On" in the SIU-DL, but don't have a DHCP-server available on the network.


Advanced Settings
Internal DHCP server
Warning! Internal DHCP server should only be used to recover modules that have been set to DHCP by mistake.
Enable internal DHCP server
OK
Cancel

2.1.4 Changing IP settings

To change the IP settings on a detected device, double-click on the device you want to configure in the list of devices. This will open up a dialog where you can enter the desired IP configuration.

To obtain the necessary information about IP address, subnet mask etc. please contact your network administrator.



DO NOT SET DHCP TO "ON" IF YOU DON'T HAVE A DHCP-SERVER AVAILABLE ON THE NETWORK.

Host Name - Here you can enter a hostname of your device (**optional**).

IP Address - The IP address of the SIU-DL.

Netmask - The subnet mask

Gateway - The default gateway

Primary DNS - The primary Domain Name Server (**optional**)

Secondary DNS - The secondary Domain Name Server (**optional**)

The default password for authentication of the new settings is "**admin**".

Pressing "**Set**" will cause the SIU-DL device to reboot and after that the new settings will be enabled.

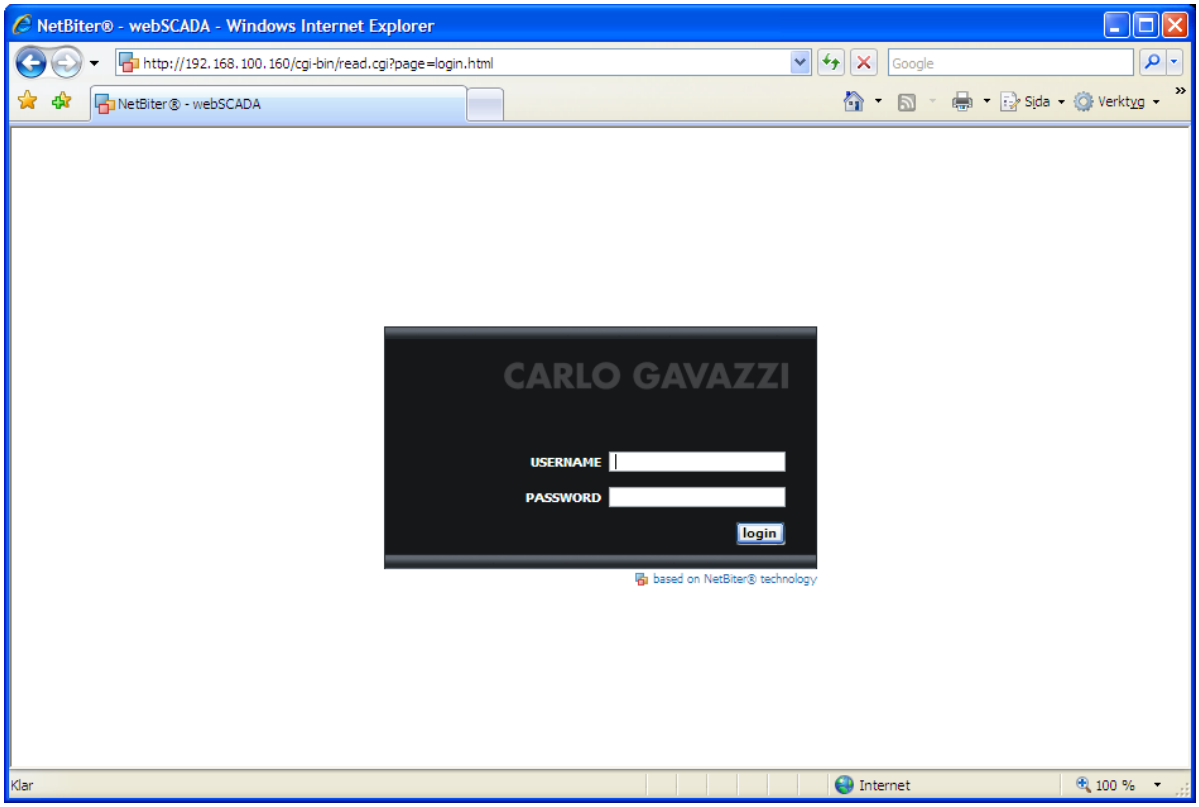
You can test the new settings by opening a web-browser and enter the IP you assigned to the device. If you selected DHCP and want to know what IP your device have been assigned, you can do a new scan with the SIU-DL Config utility to view the new network configuration.

2.2 Log in

Open a web browser (Internet Explorer for example) and enter the IP address you have set on the SIU-DL unit with the SIU-DL Config utility. For example, if you entered the address 192.168.100.160 then you should enter the text below in the address field of the browser and press enter.

http://192.168.100.160

Now you should see the login screen:



To be able to configure the Gateway you should enter "**admin**" in the user-name box.
The default password is "**admin**".

You can later change the default password to something else (recommended).
This will be described in section Users on page 36.

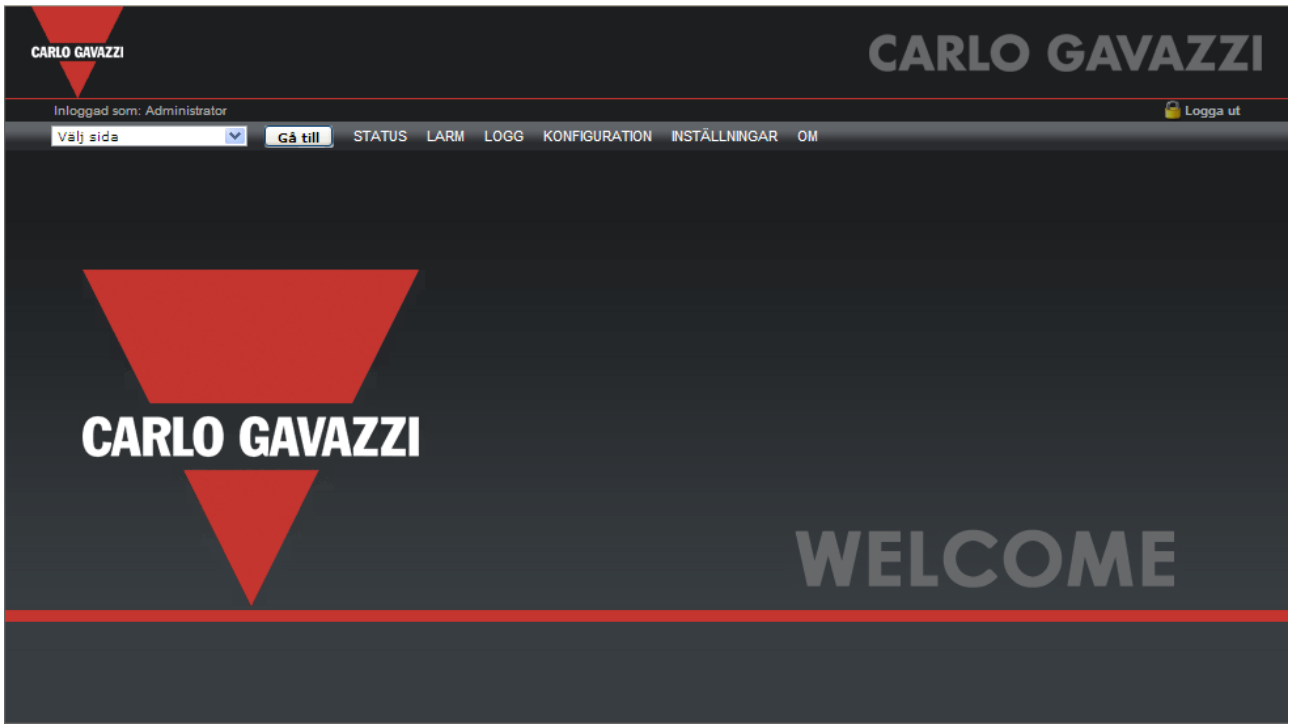
If you have problems to log in and you are sure that your password is correct, make sure that
"Caps Lock" is not enabled on your keyboard.

3 Web-page overview

3.1 Browser requirements

The web-pages are optimized for Internet Explorer and Mozilla Firefox. Other browsers can work as well, but the web-pages might appear differently. **The browser must be JAVA enabled, to use pages with JAVA content (like the graph page).** If it's not, please visit www.java.com to download a JAVA-plugin for your browser.

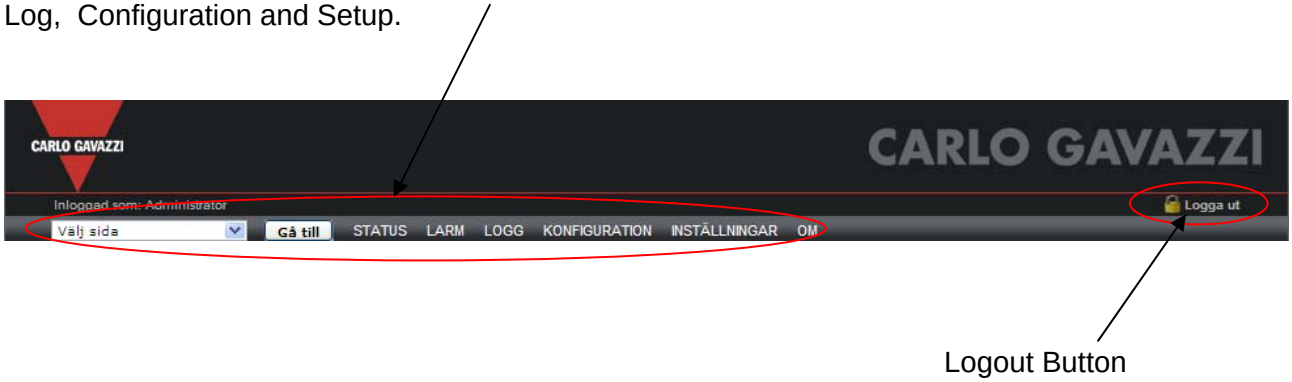
The picture below shows the welcome screen which is shown when you first log into the module.



The picture below indicates an example how the continuous data can be presented in the tables, up to 20 values can be shown on every page. Choose a page from the drop list “Select page” to be shown and click on “GO”.

3.2 Menu overview

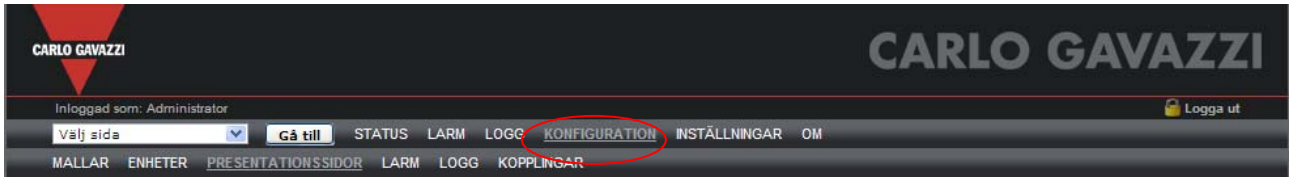
To navigate on the web-pages, use the menu items available: Select Page(**Go**), Status, Alarm, Log, Configuration and Setup.



Logout Button

3.2.1 Configuration menu

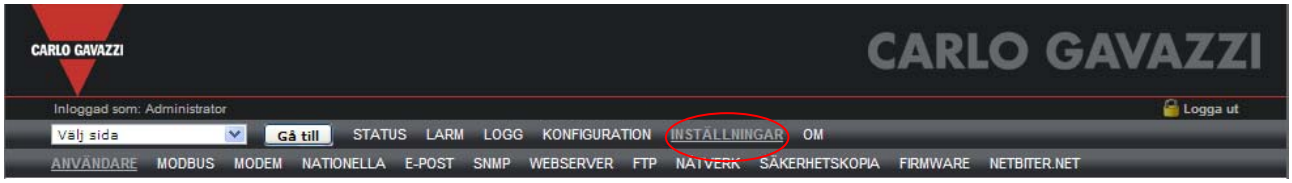
When you choose the **Configuration** menu, a sub menu will appear:



- The "**Templates**" configuration sub-menu will be used to create, edit and backup templates for your devices.
- On the "**Devices**" screen you define the devices which you connect to the DataLogger.
- On the "**Pages**" screen you create and edit the structure of the presentation web-pages and also select parameters to be presented.
- The "**Alarm**" screen can be used to enable/disable SMS/Email/SNMP alarms, and also to create and modify alarm parameters.
- On the "**Log**" configuration screen it's possible to configure the behaviour of the log-file, and also create/modify log-parameters.
- The "**Bindings**" configuration screen makes it possible to enable automatic parameter "copying" from one Modbus slave to another at a configurable interval.

3.2.2 Setup menu

When you choose the **Setup** menu, a sub menu will appear:



- The "**Users**" screen is where all things related to user management are handled.
- The "**Modbus**" screen handles all ModbusRTU and ModbusTCP configuration.
- The "**Modem**" screen handles all modem configurations (Analogue, GSM, GPRS, dial-up, dial-in).
- The "**Regional**" settings screen configures things like date/time and generic module information.
- The "**E-mail**" screen configures all that is needed to send emails from the DataLogger.
- The "**SNMP**" screen makes it possible to configure SNMP trap properties.
- The "**Webserver**" screen can be used to define which port the DataLogger web-server should use.
- The "**Ethernet**" screen handles all TCP/IP configurations, like IP-address, DHCP, DNS etc.
- On the "**Backup**" screen it's possible to backup/restore all settings, and also do a factory reset of the DataLogger module.
- The "**Firmware**" screen can be used to download new firmware to the module.
- The "**Netbiter.net**" screen is used to setup the device to use the Netbiter.net services, see APPENDIX C: SNMP
- If SNMP Alarms is enabled, see page 32, all alarms will be sent as SNMP traps to the host specified on the SNMP page, see section 5.6 on page 45.

The OID is sent in the following format in numbers:

.1.3.6.1.4.1.23312.1.1.2 [IP address][event]

.1.3.6.1.4.1.23312.1.1.[trap_id][trap_data]

where.

23312 is Intellicom enterprise ID

1.1 is products SIU-DL DataLogger

and where event:

1 = Alarm set

2 = Alarm cleared

A trap id is divided into five messages with following trap data:

#1 Alarm ID

#2 Alarm description

#3 Class ID (1-10)

#4 Class description

#5 Alarm severity, where

0 = indeterminate

1 = critical

2 = major

3 = minor

4 = warning

5 = cleared

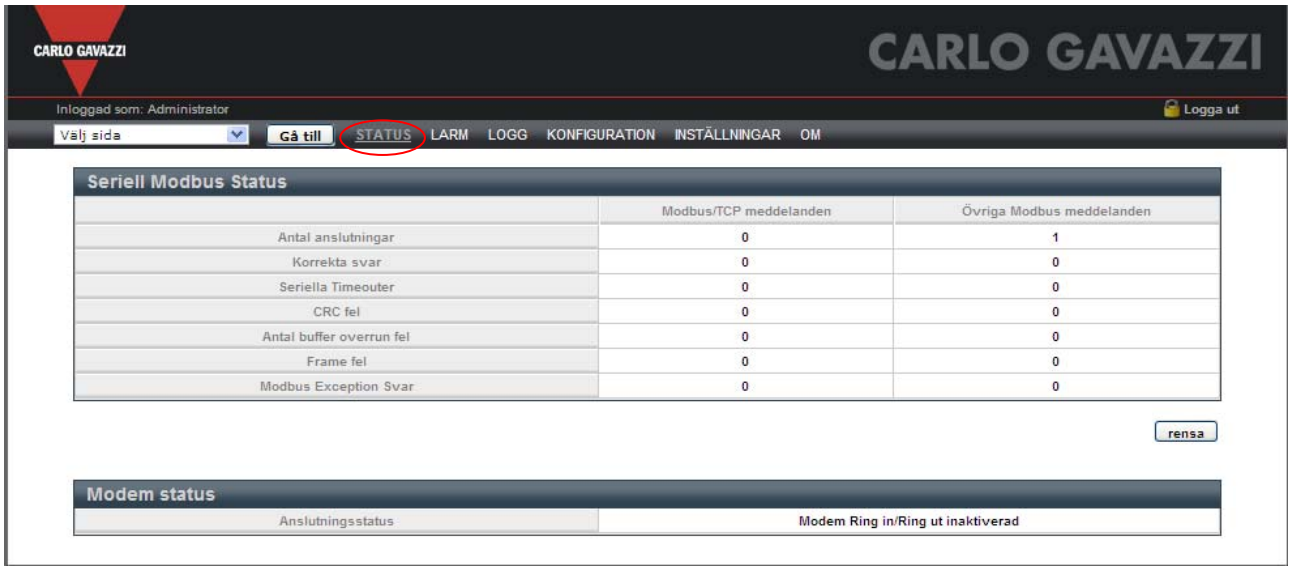
See the pictures for example of SNMP trap sent an alarm to warning of high temperature from a SIU-DL.

To try out the SNMP functionality the software Trap Receiver could be used. This program can be found at http://www.trapreceiver.com. Please, check the license for the software. It could be used to examine a trap sent to a PC to better understand the SNMP functionality of the SIU-DL DataLogger.

- APPENDIX D: Netbiter.net at page 55 for more information.

3.3 Status

This page shows some status information about the Modbus interface. The Status screen is split into two columns, “Modbus/TCP messages” and “Other Modbus messages”. The Modbus/TCP messages field shows information about requests that originate from a master attached to the gateway, and Other Modbus messages field shows information about requests that originate from either internal applications (Log/Alarm) or WebPages.



Number of connections - Indicates the number of open connections to a Modbus TCP master. Internal queries indicate number of pending queries from WebPages + the internal connection from (Alarm/Log) application.

Valid Responses - Counts valid responses from the Modbus/RTU slaves.

Serial Timeouts - The number of time-outs from attached slaves.

CRC Errors - The number of CRC errors on incoming Modbus/RTU responses.

Buffer Overruns - If an incoming Modbus/RTU response is larger than 300 bytes, this will cause the input buffer to overflow.

Frame Errors - If an incoming Modbus/RTU response has incorrect length or some other fault in the frame, this will cause a Frame Error.

Exception Responses - Counts all exception responses from the connected Modbus/RTU slaves.

Modem Status

The modem status field gives information about what state an attached modem is in.

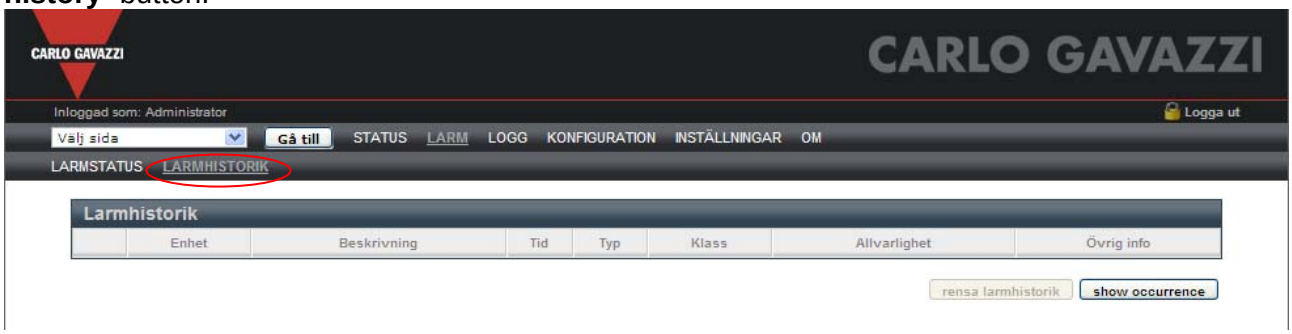
- **Connecting to Internet**:
  Calling Internet Service Provider and negotiate for a connection.
- **Waiting for incoming connection**:
  The unit is waiting for an incoming call.
- **Waiting for Event/Alarm**:
  The unit is in standby mode, and when an alarm or event appear it will connect to Internet.
- **Connection established**:
  A connection to Internet is established and data will be sent.
- **Incoming connection is in progress**:
  There is an incoming call and correct baud rate, user name and password is being verified.
- **Modem disabled**:
  Not possible to connect using the modem

3.4 Alarm

The Alarm page shows all active and unacknowledged alarms. It is also possible to select to view the status of all configured alarms. Use the button in the lower left area of the screen to toggle between the two modes.

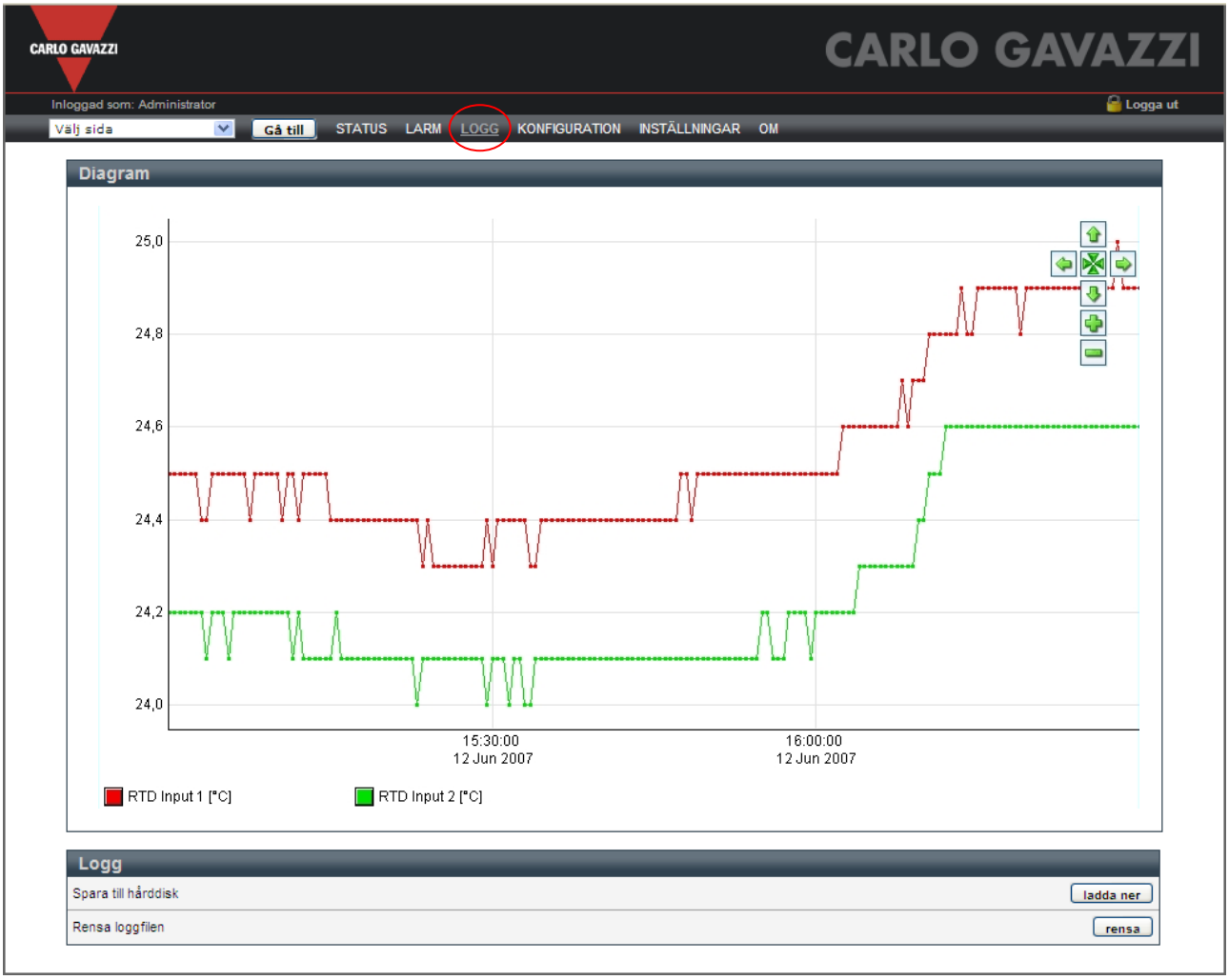
3.4.1 Alarm history

The “Alarm History” screen shows all alarms that have occurred. To clear this list, click the “**clear history**” button.



3.5 Log

From this page it's possible to download the log file from the DataLogger (if logging has been enabled). Simply click the "**download**" button to download/view the file, or click the "**clear**" button to remove all data from the log-file. To view the log-file as a graph, make sure that JAVA is installed on your computer.



The graph will show all parameters in the log-file, but in the graph it's possible to select which parameters to show (by clicking on the square next to the parameter name).The three first log points will be displayed in the graph. To show a log-point just click the square in front of the parameter name. To make it disappear from the view click the square again.

At the top right corner there navigation buttons:

- Scroll graph up
- Scroll graph left
- Scroll graph right
- Scroll graph down
- Back to starting view
- Zoom in
- Zoom out

By using a left click on the mouse, keep the button down and release it at the diagonal corner of a box the graph will zoom to that size.

By right clicking and keeping the button down the graph can be scrolled by moving the mouse.

4 Module Configuration

An important concept for the DataLogger is the usage of templates. This allows the user to define templates for different products and configurations, and then easily re-use and distribute them. A template contains properties for available parameters in a device of a certain type. These properties includes: Parameter Names, Modbus register types and addresses, data scaling and presentation.

See also Application Note **AN-1003** for more details about how to create a configuration.

(Can be downloaded from www.intellicom.se/support).

4.1 Work-flow

Follow these steps to get your DataLogger operational:

1 – Do all generic Setup, like assigning an IP-address (Setup/Ethernet), add/modify users (Setup/Users),
configure the Modbus interface (Setup/Modbus) and set date/time (Setup/Regional).

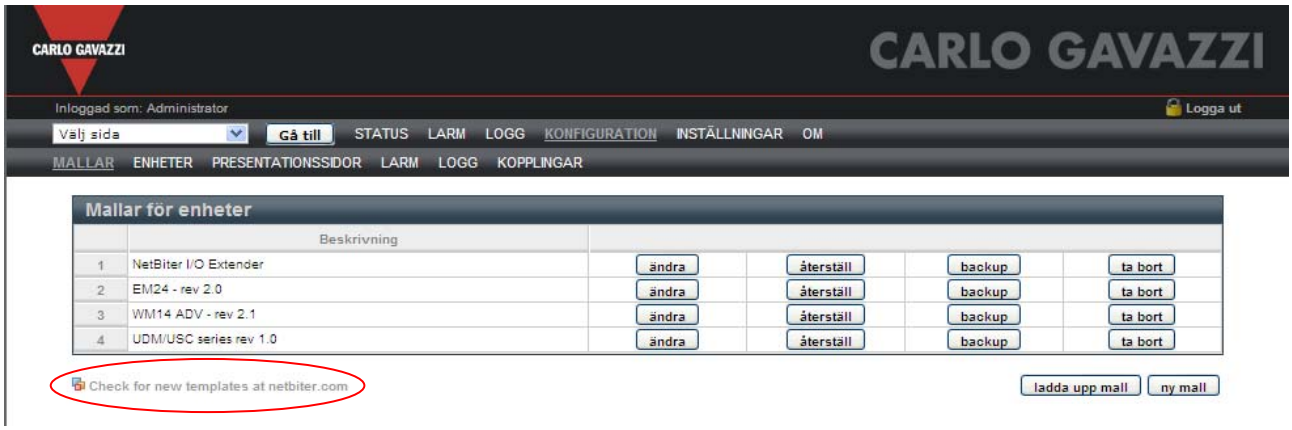
2 – Create a template (Configuration/Templates).
A Template consists of one or several groups, and each group is a collection of Modbus Parameters.

3 – Define your Devices (Configuration/Devices).
Device is simply a Modbus slave, with a unique Modbus address. For each Device, you apply a Template.

4 – Create your Application! Now you can define your web-pages, alarms, log entries and bindings.

4.2 Create a template

Clicking on the "**Configuration**" and then "**Templates**" link will bring up the following screen:

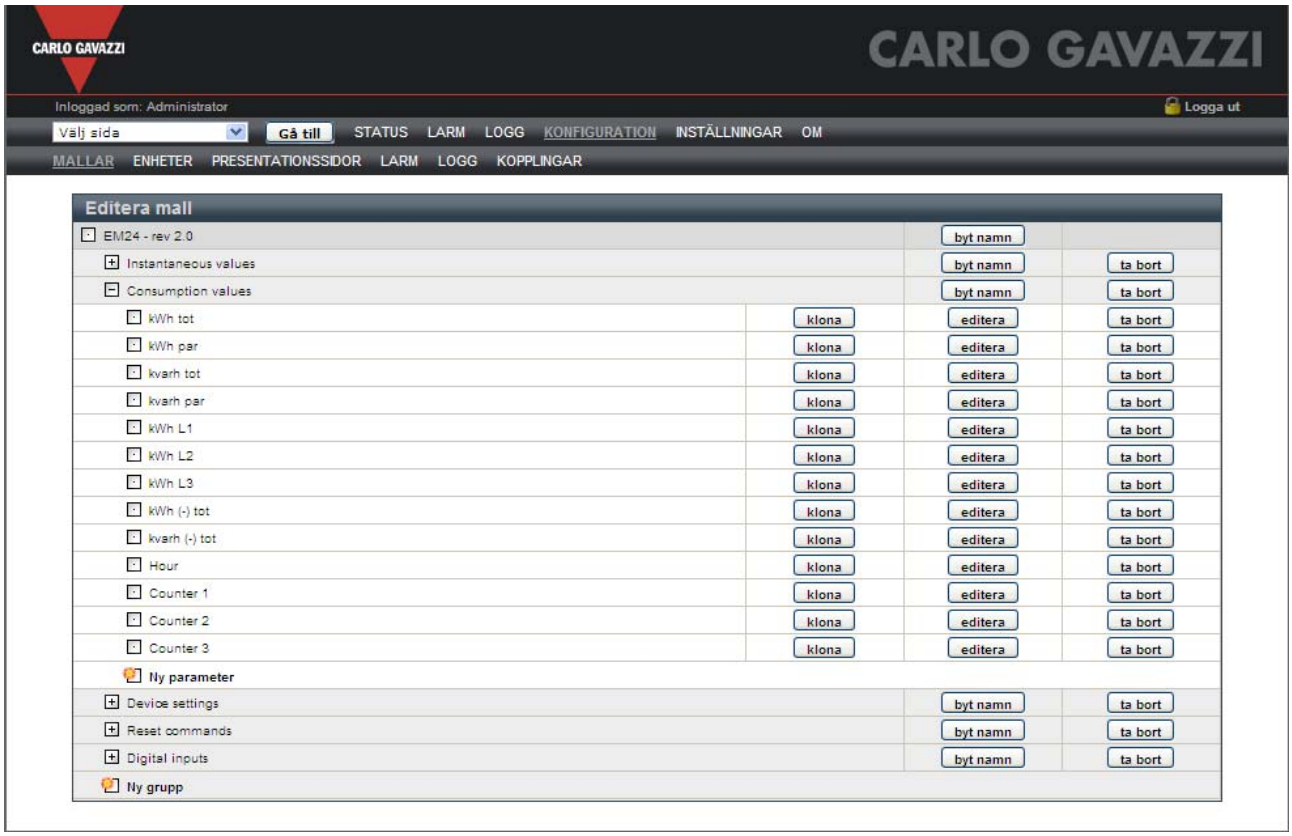


To create a template, click the "**add template**" button. Enter the name of the template in the window that pops up. Click "**edit**" to make it possible to add new groups (a collection of parameters) and new parameters, or edit an existing template. From this page it is possible to backup, restore (update templates) and delete templates.

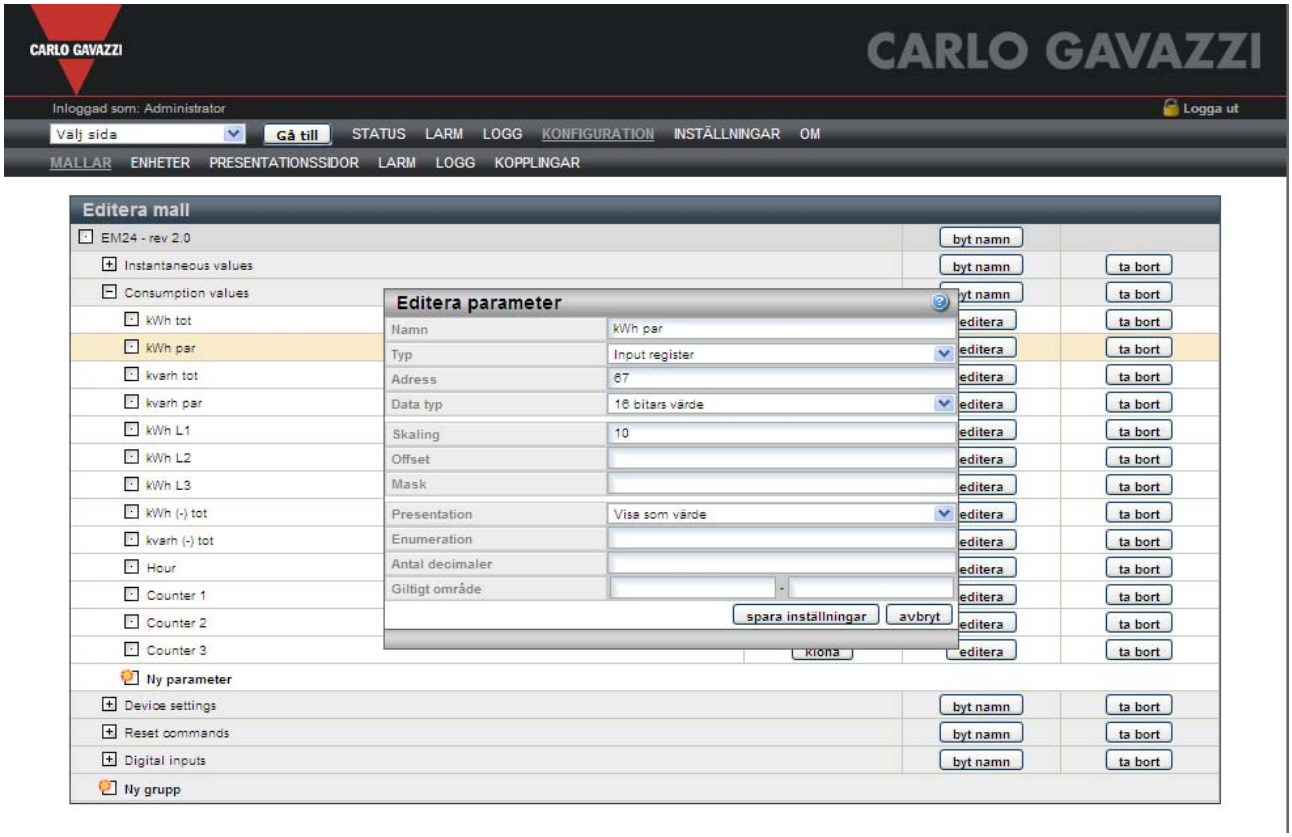
To upload a template click the "**upload template**" button to upload a template. There will be a window appearing waiting for the user to browse to the template file, and click "**upload template**" when the file is found.

Also check out the IntelliCom Template page, where templates from different manufacturers will be published.

You must always add a Group, before you can add a Parameter.



When you have created a Group, and at least one parameter, it's possible to edit the Parameter by clicking the "**edit**" button. This will bring up the following screen (Edit Parameter):



Click on the "?" to view the online help at the upper right corner of the Edit Parameter window

The “Edit Parameter” screen contains the following fields:

Name – Description of the parameter.

Type – Modbus type (Holding, Input, Coil, Discrete)

Address – Modbus address

Datatype - Defines the datatype of the Modbus register. Can be one of the following:

Unsigned 16 – 16-bit positive value
Signed 16 **–** 16-bit value, with sign

Unsigned 32 - 32-bit positive value. Most significant word (register) on **low** address.

modbus reg	i		i+1	
Int32	1(MSB)	2	3	4(LSB)

Signed 32 - 32-bit value, with sign. Most significant word (register) on **low** address.

modbus reg	i		i+1	
Int32	1(MSB)	2	3	4(LSB)

Unsigned 32 (swapped) **-** 32-bit positive value. Most significant word (register) on **high** address.

modbus reg	i		i+1	
Int32 (s)	3	4(LSB)	1(MSB)	2

Signed 32 (swapped) **-** 32-bit value, with sign. Most significant word (register) on **high** address.

modbus reg	i		i+1	
Int32 (s)	3	4(LSB)	1(MSB)	2

Float – 32-bit floating point. (IEEE-754) Most significant word (register) on **low** address.

modbus reg	i		i+1	
Float	1(MSB)	2	3	4(LSB)

Float (swapped) **-** 32-bit floating point. (IEEE-754) Most significant word (register) on **high** address.

modbus reg	i		i+1	
Float (s)	3	4(LSB)	1(MSB)	2

Double **-** 64-bit floating point. (IEEE-754) Most significant word (register) on **low** address.

modbus reg	i		i+1		i+2		i+3	
Double	1(MSB)	2	3	4	5	6	7	8(LSB)

Double (swapped) **-** 64-bit floating point. (IEEE-754) Most significant word (register) on **high** address.

modbus reg	i		i+1		i+2		i+3	
Double (s)	7	8(LSB)	5	6	3	4	1(MSB)	2

Scaling - The Modbus register value will be <u>divided</u> by the scale value before presented on the web-page, logged or compared with for alarm.
It will be <u>multiplied</u> with the scale value before value is written to a slave device.

Examples:

Modbus register value = 510, Scale value = 10 → 51,0 will be viewed on web-page.

Modbus register value = 5118, Scale value = 100 → 51,18 will be viewed on web-page.

Web-page input = 127,5 Scale value = 10 → 1275 will be written to Modbus register.

Offset – The Modbus register value will be subtracted with the offset value before it is presented on the web-page, logged or compared with for alarm. If scaling is also in use it is done before the offset is subtracted.

The Offset value will be added to the value before value is written to a slave device. If scaling is also in use it is done after the offset is added.

Mask - Is used to mask out specific bits from the Modbus register, on the webpage the value is presented in binary. The Modbus register will be masked (logic and) and shifted to the right before the value is presented on the web-page, logged or compared with for alarm.

Examples:

Modbus register value = 214 (D6 hex), Mask = 240 (F0 hex) → 1101 (13) will be viewed on web-page.

Presentation - Defines how a value will be represented on a page. Available options are:

Show as value
This option will read from the address and present the result at the view-page.

Writeable value
This option reads the value from the address and presents it. There will be a set button next to the
value at the view-page which makes it possible to write to the address.

Show with enumeration
This option will read the value from the address and present it with the corresponding enum string
(See Enum below).

Writeable value with enumeration
This option will read the value from the address and present it with the corresponding enum string. There will be a drop down next to the value at the view-page where available enum strings will be selectable. A selected value will be written to the address.

Enum - here the enum variables is defined in following format [number]=[string].
Each enum is separated by a semi colon ';' with no blank spaces.

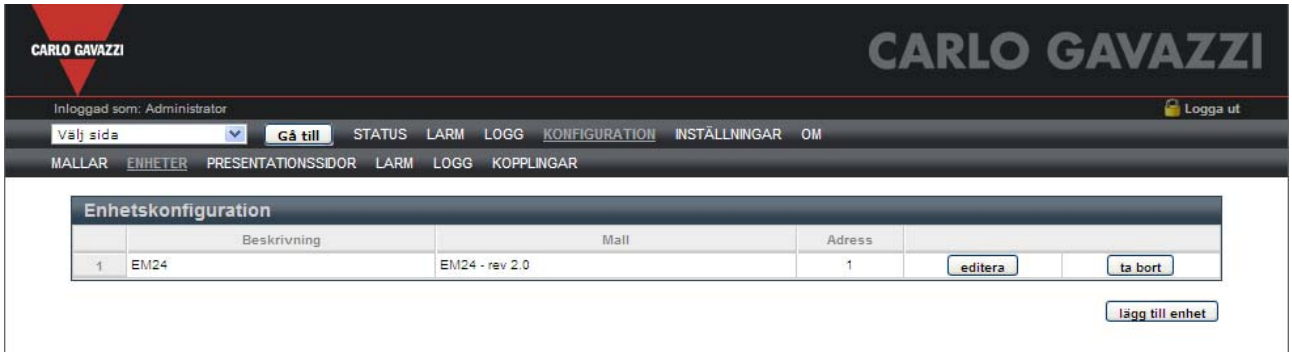
Examples:
0=Off;1=On
0=Sunday;1=Monday;2=Tuesday;3=Wednesday;4=Thursday;5=Friday;6=Saturday

Number of decimals – Defines how many decimals to use for this point.

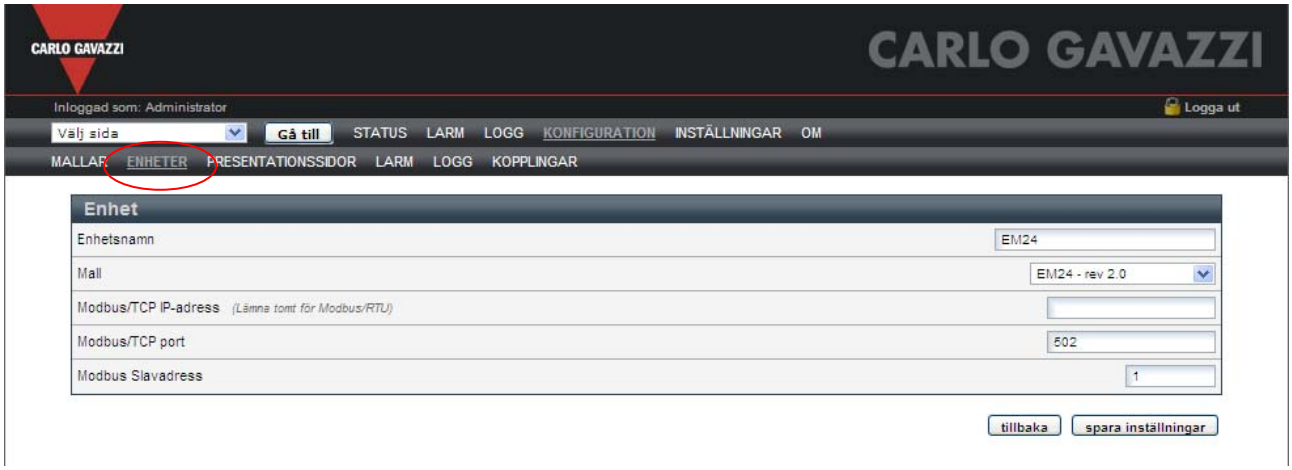
Valid range – defines min and max value for a write parameter. If a user tries to enter a value outside the range, a warning message will appear.

When you are finished with the Template, continue to the Device Configuration.

4.3 Device configuration



On the Device Configuration page, you define which Modbus slaves are attached to the DataLogger. To add a device, click the "**add device**" button. This will bring up the following screen:



Name – A description of the device.

Template – Defines which template that should be associated with this device.

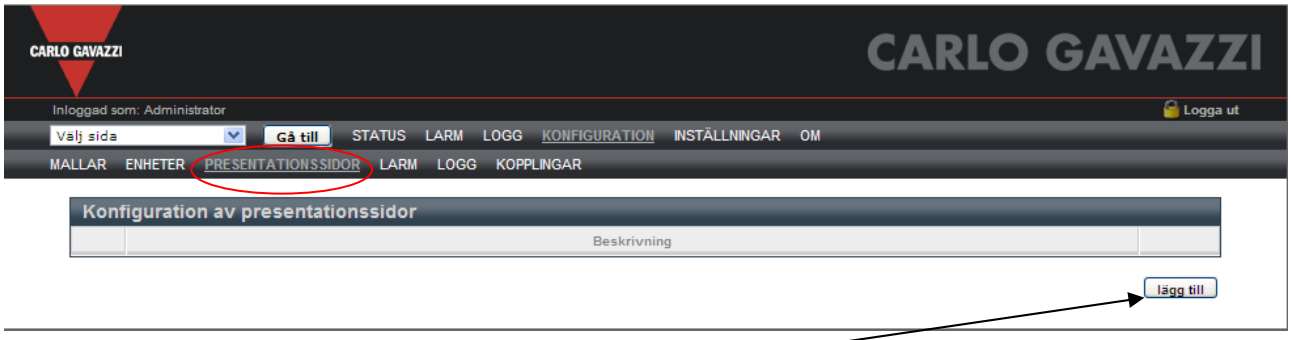
Modbus/TCP server IP address – If using Modbus/TCP the IP address should be entered here. When using Modbus/RTU it should be left blank.

Modbus/TCP server port – The port that is used for the Modbus/TCP communication.

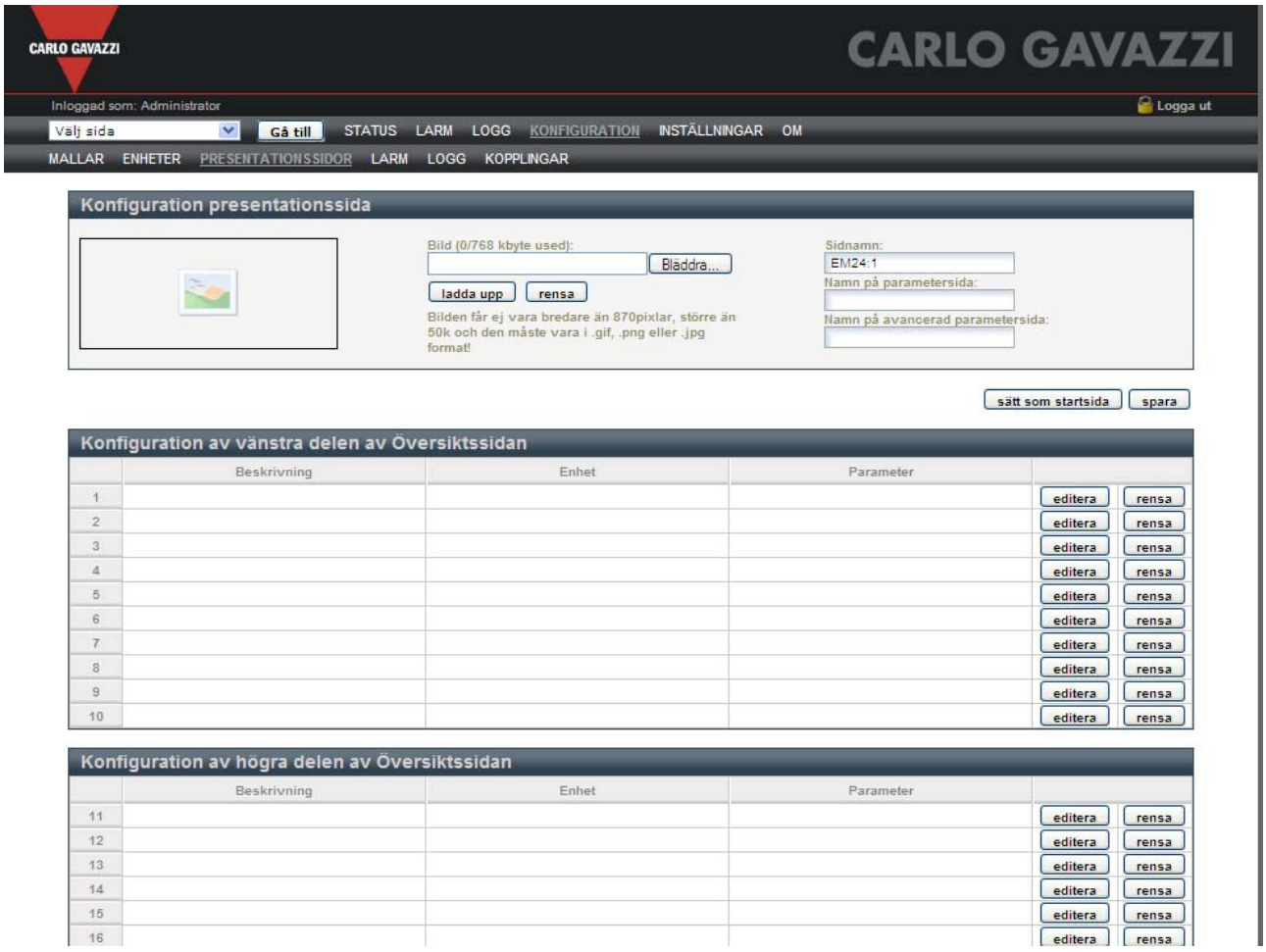
Modbus slave address – Defines the Modbus address for this device.

The next step is to create your DataLogger application, by defining the look of the web-pages and which alarms and log-parameters that should be available.

4.4 Pages



To create a new page, click the "**add page**" button. This will bring up the General Page Configuration:



On this page all page properties can be configured. A maximum of 20 Modbus points can be on each page.

Next step is to define where to display the parameters. Simply click the "**edit**" button on the position you want to work with.

4.4.1 Adding parameters to web-page

Now select the Device, Group and Parameter and enter a description for this parameter, and finish by clicking the "**save settings**" button. To check that everything is OK, go to the "Select page" in the menu, select the page you have been working with and hit the "**Go**" button. You can also define a "presentation format" and "presentation scaling" on this page.

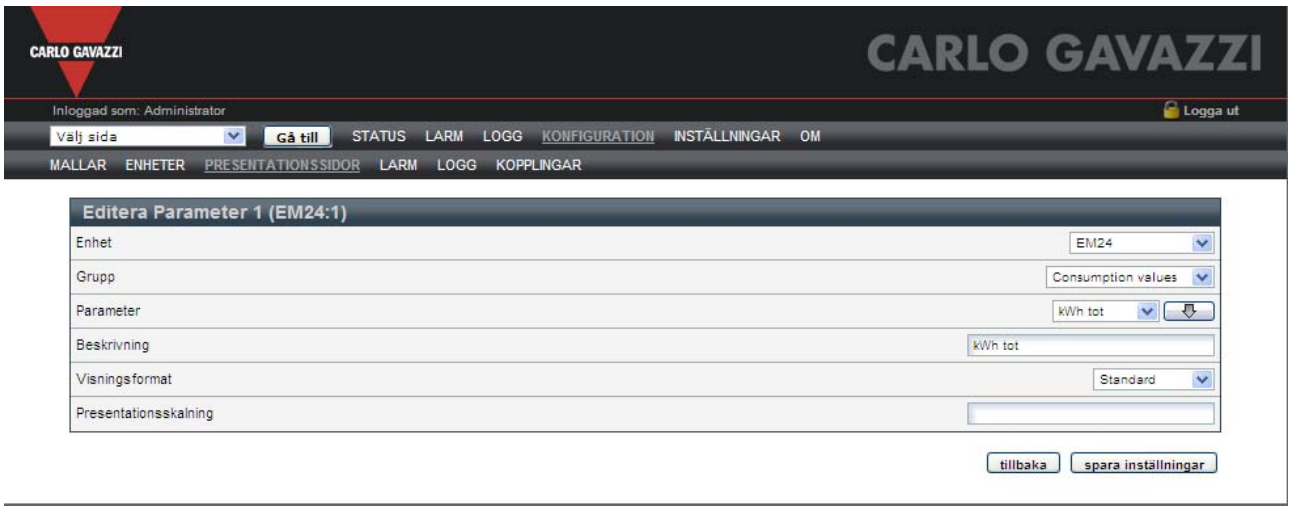
Presentation format – You can select a different presentation for a value on the presentation pages.

- Default Value is presented as it is configured in the Device template.
- Hexadecimal Value is presented in hexadecimal form.
- Binary Value is presented in binary form.

Presentation scaling – You can add an additional scaling on the value before it is presented on the
web-page.

The value will be **divided** by the scale value before presented on the web-page. It will be **multiplied** with the scale value before value is written to a slave device.

It is normally better to use the scaling in the Device template because that will also include logging and alarm.



4.4.2 Picture

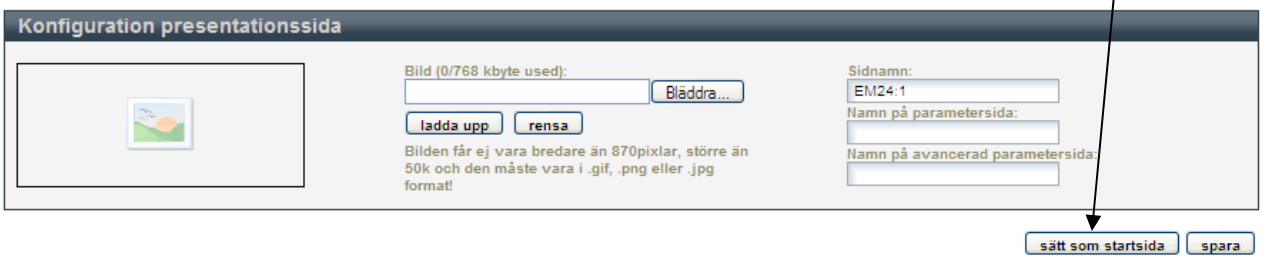
This option lets you choose a picture to be presented on the page. The picture must not be more than **870 pixels wide** and must be in gif, jpg or png-format. The picture will be sent to the device when you press the "**Upload**" button. To remove a picture from the device, press the "**Clear**" button.

There are maximum 800kB available for pictures. On the General Page configuration section you can see how much space remains.

4.4.3 Page name

This field can be used to give the page a more descriptive name. Click the "**set as start page**" button if this page should be the first page to be presented when logging into the module.

It's also possible to change name on the Page menu (default "Overview" and "Advanced Overview").

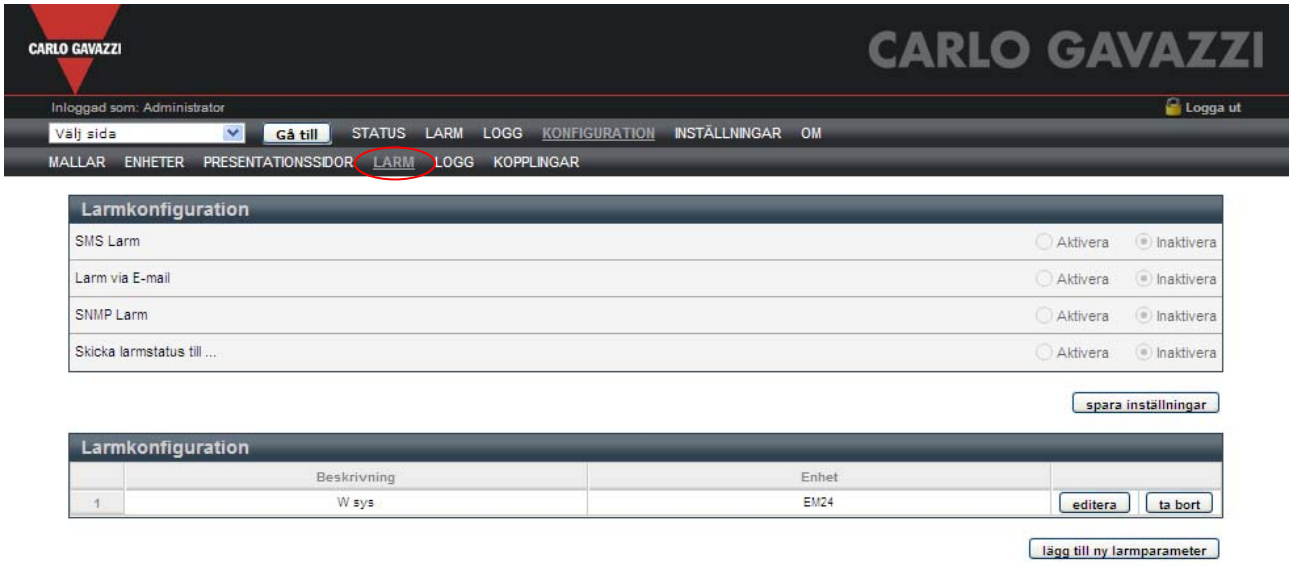


4.5 Alarm configuration

The SIU-DL DataLogger can send alarm messages with email, SMS or SNMP (traps). **(SMS alarms require an external GSM modem).** The alarm functionality can be enabled/disabled on the Alarm configuration page.

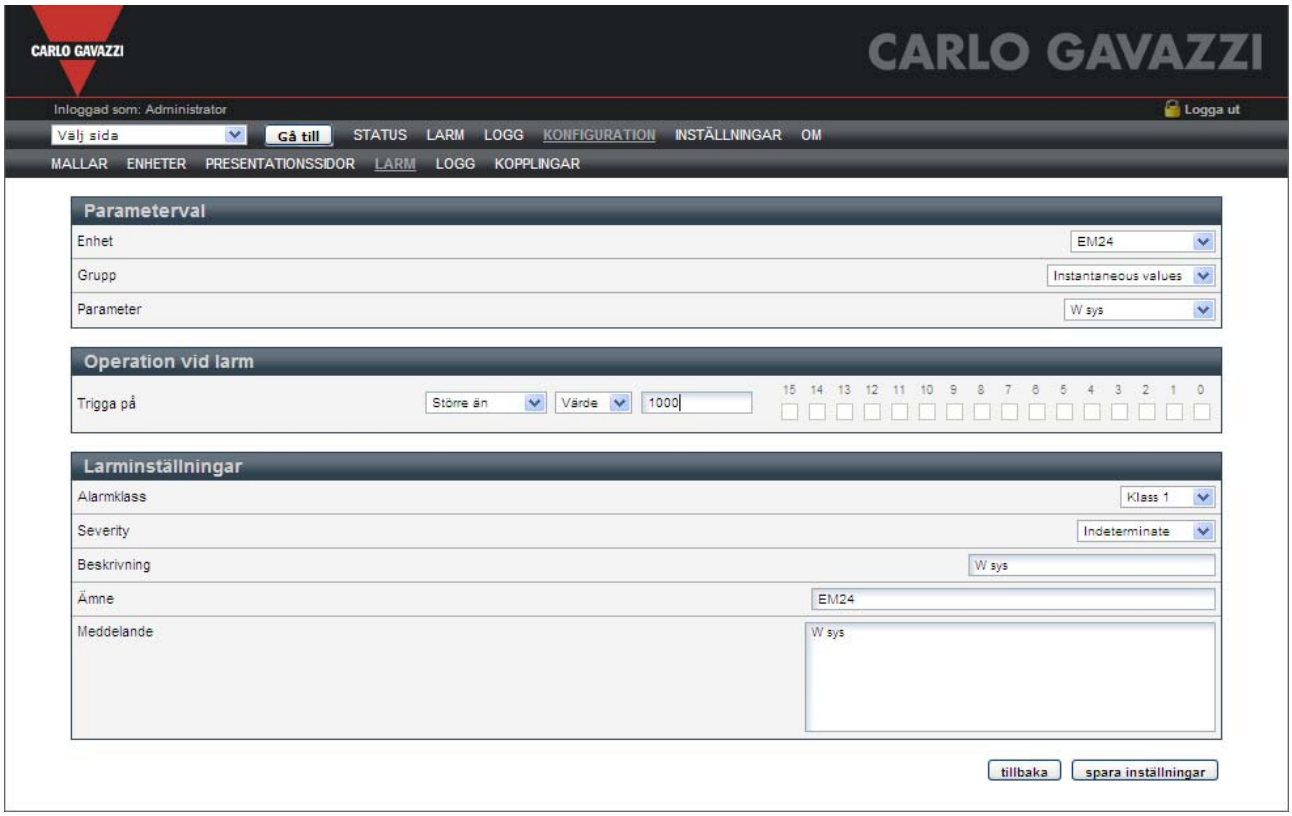
A maximum of 64 alarm parameters can be configured.

To upload alarm status to Netbiter.net it has to be enabled on this page. Make sure that the Netbiter.net account is activated on the page Setup/Netbiter.net, see section.



4.5.1 Defining alarms

To add an alarm point, click on the "**edit**" button in the Alarm Configuration list. This will bring you to the following screen. Here you need to select which parameter to use, and define the trigger operation that will activate the alarm. You also need to define some properties like alarm class (1-10), and what strings should be in the subject and message field of SMS/Email alarms.

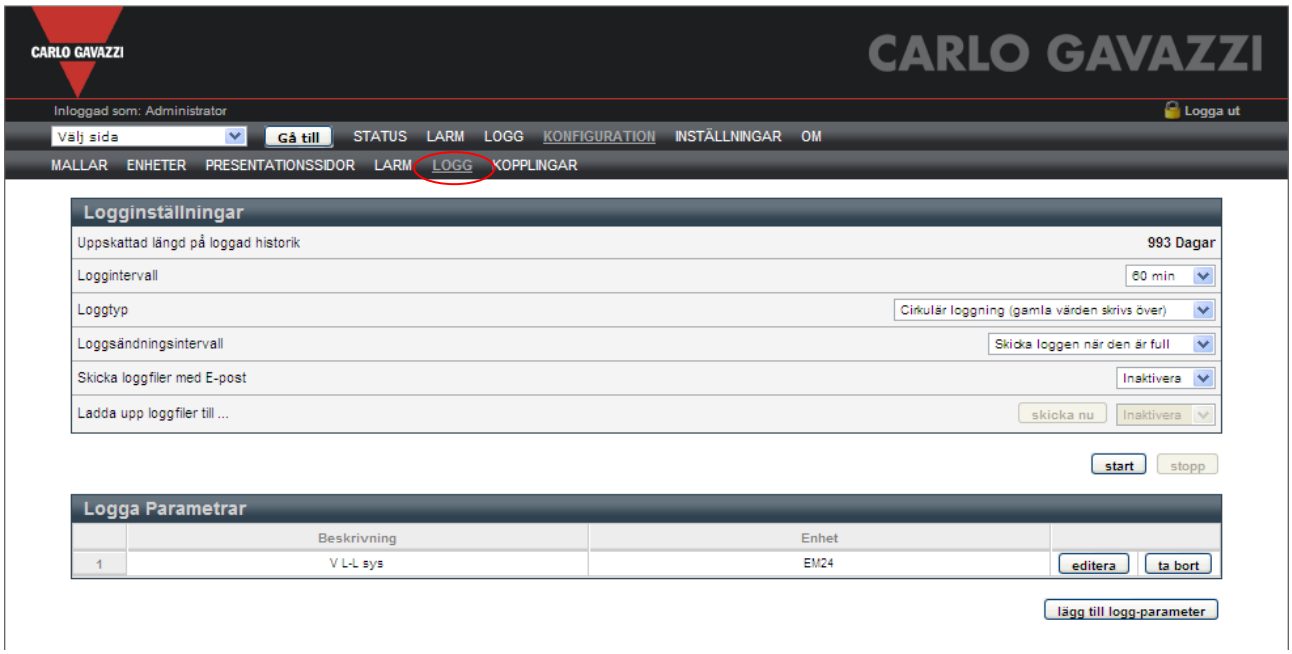


- **Trig On** - this configures the trig condition for the alarm parameter. It's possible to trigger on a Value ('Higher than', 'Lower than', 'Equal to', 'Not Equal to', 'Change of Value') or on a bit-field ('Any bit', 'Neither bit', 'All bits'). The option 'No response' is used to send an alarm if there is no response from the module.
- **Alarm class -** Can be used to set different priorities on the alarm (class 1-10). The Alarm Class has to be set for each user that alarm message will be sent to. This is done at the configuration page for the user.
- **Severity** – The severity of the alarm.
  - Warning
  - Minor
  - Major
  - Critical
  - Indeterminate

  The alarm could also have the severity Cleared, that cannot be set but will be sent via SNMP when the alarm is in normal state.
  Every alarm will be sent as a SNMP trap message.
- **Description** – The text that is displayed in the alarm views and sent via SNMP.
- **Subject –** Defines the text to be shown as Subject in the email/SMS
- **Message –** The body of the alarm message

4.6 Log configuration

SIU-DL DataLogger can be used to log Modbus registers. All data is stored in a CSV-file that can be uploaded to a computer for further analysis in e.g. Excel. A maximum of 64 parameters can be configured.



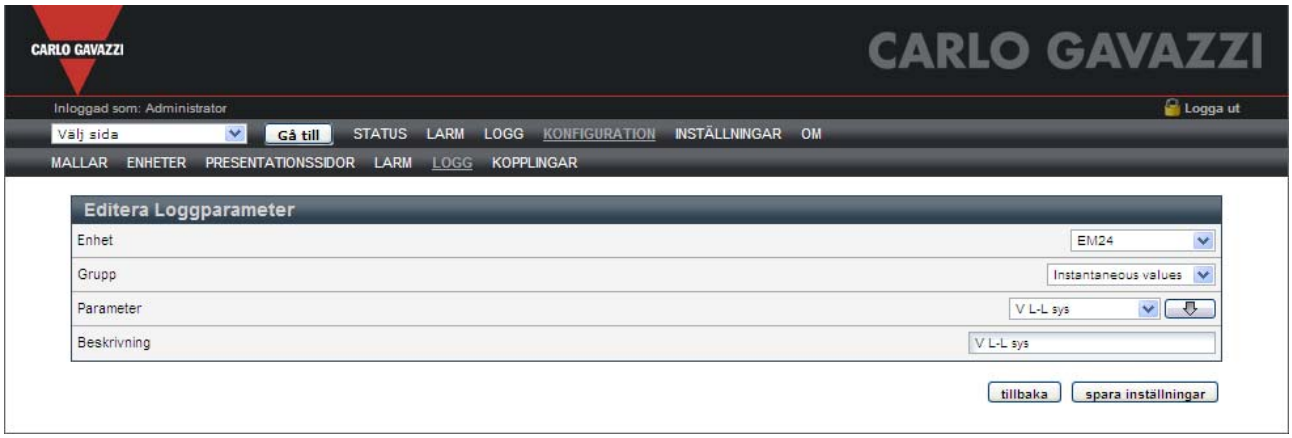
To start logging, click the "**start**" button.

- **Estimated Log Time –** gives an estimate about how long it takes to fill the log-file.
- **Log interval –** defines the sample interval.
- **Log type –** choose whether to stop logging when the log has reached its maximum, or to overwrite old values (circular log).
- **Send log interval** – enable this if you want to send the log-files periodically with e-mail or ftp. You can choose to send the log every hour, every day (will be sent around midnight) or every week (Sunday at midnight). You will also need to activate this function on each user that should receive the log-files.
  Send log files with E-mail – enable this if you want to send the log-files periodically with email with the Send log interval set above. Make sure that each user that should get the logs by email has this function activated for the user. This is configured at Setup/User and edit settings for that user, see section 5.1 on page 36.
- **Upload log files to ftp server** – enable this to upload log-file to ftp server periodically with email with the Send log interval set above. Make sure that the Netbiter.net account is activated, or that there is a ftp-server stated at Setup/FTP, see section **Fel! Hittar inte referenskälla.** on page **Fel! Bokmärket är inte definierat.**.
  When the log is stopped there will be no more log sent. When the logging is started again the log will be cleared. To send the latest logged data there is a "**send now**" button before restarting the logging.

> **The log-file that is stored in the SIU-DL will contain historical data for a maximum of two periods as defined in the "Send log files with E-mail" property. I.e. if you set this to every day, the log-file in the SIU-DL will keep a maximum of two days historical.**

See also **Setup/Regional** settings to make sure you have the correct settings for list separator and decimal symbol, see section 5.4.2 on page 42.

To add a log-point, click the "**add log parameter**" button, and then the "**edit**" button. This will bring you to the "Edit Log Entry" page.

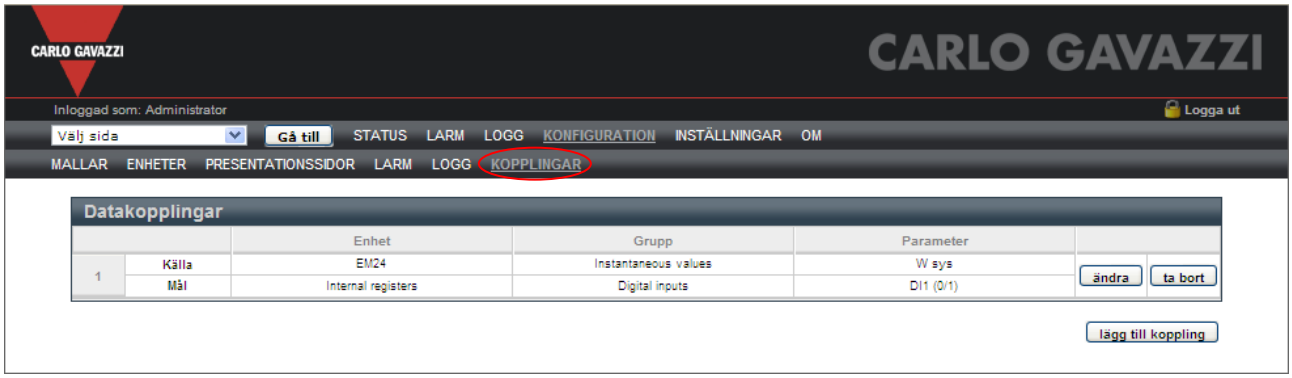


Now you can select the Device/Group/Parameter you want to log, and also enter a description for this
Log Entry. To finish, click the "**save settings**" button.

4.7 Bindings

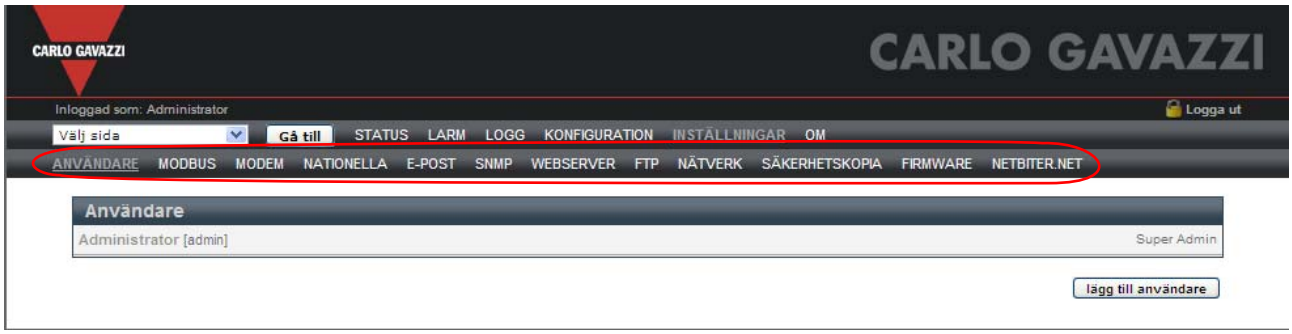
Bindings are a feature that allows you to "copy" parameters from one Modbus device to another. To add a binding, click the "**add binding**" button.

On the "Add Data Binding" screen you choose the Source and Destination parameter, and the interval for the copying of data.



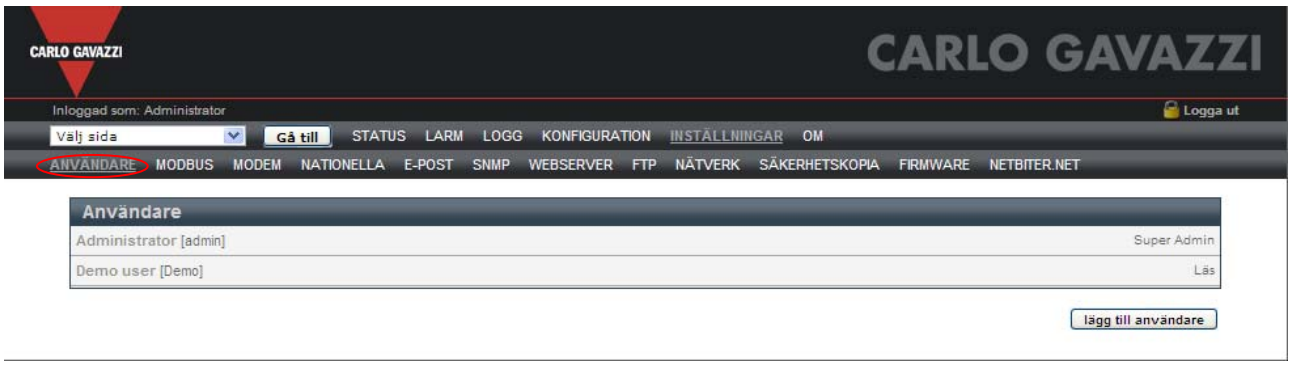
5 Module Setup

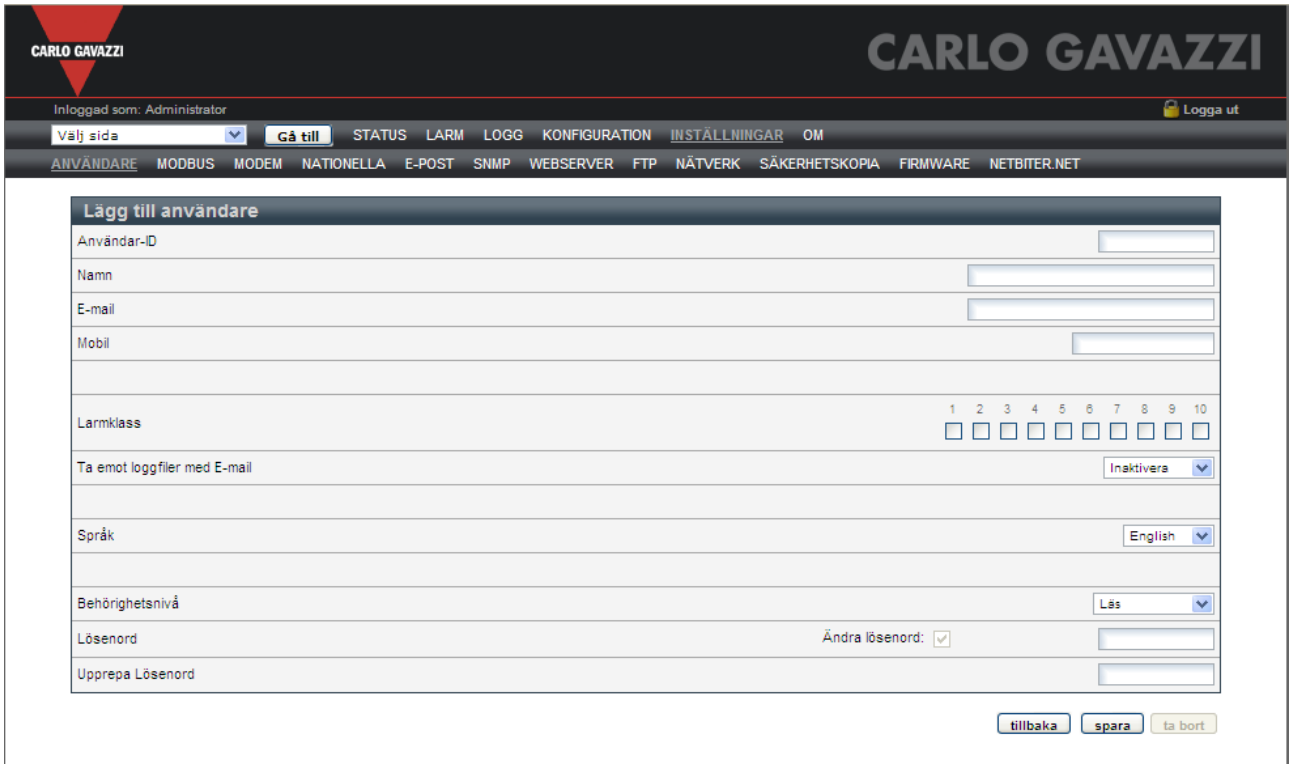
If you click on the Setup menu option, a sub menu will appear. Here you can do all necessary setup for things like user administration, modem settings and TCP/IP settings.



5.1 Users

If you press the "**Users**" link you will be transferred to the Users administration page. Here you can add, edit and remove users. To add a user, press the "**add user**" button, and to modify/remove a user click on the user you want to modify/remove.





Here you can enter the **User ID** (used on the login screen), **name**, **contact info** and a **password**.

If an e-mail address is entered, then alarms will be sent to this address (if user is configured as an alarm recipient and e-mail alarm is enabled).

If a mobile number is entered, then SMS-alarms will be sent to this number (if user is configured as an alarm recipient and SMS-alarm is enabled).

To configure a user as an alarm-recipient, enable one or more of “Alarm classes” (Class 1-10). It has to be set to get alarm mail or SMS for an alarm point with the corresponding alarm class set. Make sure that the alarm has the correct alarm class set when edit the alarm point, see 4.5.1 on page 33.

The user will only receive alarms that match this selection.

The “Receive log files via E-mail” option configures whether this user will receive logs via Email or not. See Configuration/Log (section 4.6 on page 34) for more details about this function.

The language selection defines which language will be used for this user.

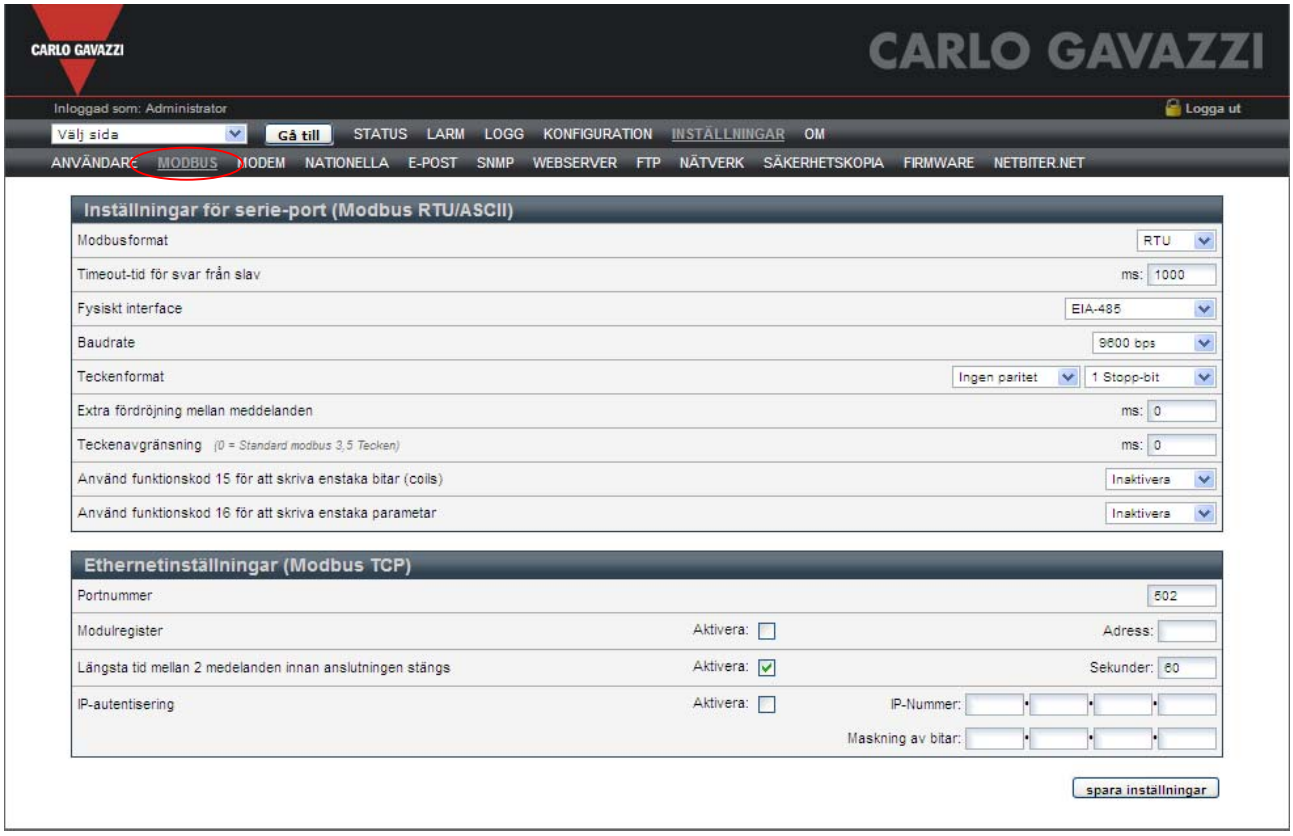
The user level defines what the user can do on the web-pages:

Read - View pages but can’t do any configuration or modify Modbus Registers
Write - Can view pages and modify Modbus registers, acknowledge alarms.
Admin - Read, Write and also configure the module (templates, devices, pages, alarms, log, and bindings)
Super Admin - Read, Write, Admin and setup module like users, modem and Modbus settings.

To add/edit users, you must be logged in as a user with Super admin access.

5.2 Modbus settings

If you press the Configuration/Modbus menu you will be presented with the following view:



Serial Settings (Modbus RTU/ASCII)

Transmission mode - Selects Modbus RTU or Modbus ASCII

Slave Response Timeout - The time that the module will wait for a response from a slave, before a Serial timeout will occur. (Default 1000 ms)

Physical Interface - EIA-485 or EIA-232

Baudrate - 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600 or 115200 bps.

Character Format - Select number of stop bits and if parity should be enabled (Odd, Even).

Delay between polls - time to delay between Modbus messages.

Character delimiter - Number of milliseconds between characters in the Modbus frame. Set to zero to use standard Modbus (3.5 characters)

Force function code 15 when writing single coil - If this option is Enabled, all writes to coils will be done with function code 15. (Useful if slaves don't support function code 05).

Force function code 16 when writing single register - If this option is Enabled, all writes to registers will be done with function code 16. (Useful if slaves don't support function code 06).

Ethernet Settings (Modbus TCP)

Port number - Which port to use for Modbus TCP communication (502 default).

Gateway Registers - The address to the gateway internal registers (if enabled). See section 5.2.1 Internal Registers on page 39 for details about the internal registers.

Server Idle Timeout - This parameter gives the idle timeout in seconds for the Modbus/TCP connection.
If the Gateway doesn't receive any Modbus/TCP query within this time the connection will be closed. (Default value is 60 seconds).

IP Authentication - This can be used to configure the IP-number that is allowed to connect to the Gateway.

It is of great importance to ensure at the time of the procedure of assigning Modbus device addresses, that there are not two devices with the same address. In such a case, an abnormal behavior of the whole serial bus can occur, the Master being then in the impossibility to communicate with all present slaves on the bus.

5.2.1 Internal Registers

If Gateway registers are enabled, queries sent to that address will not be forwarded to the Serial Modbus/RTU network; the Gateway will respond to these queries by itself.

See **Appendix B** for a list of the internal registers.

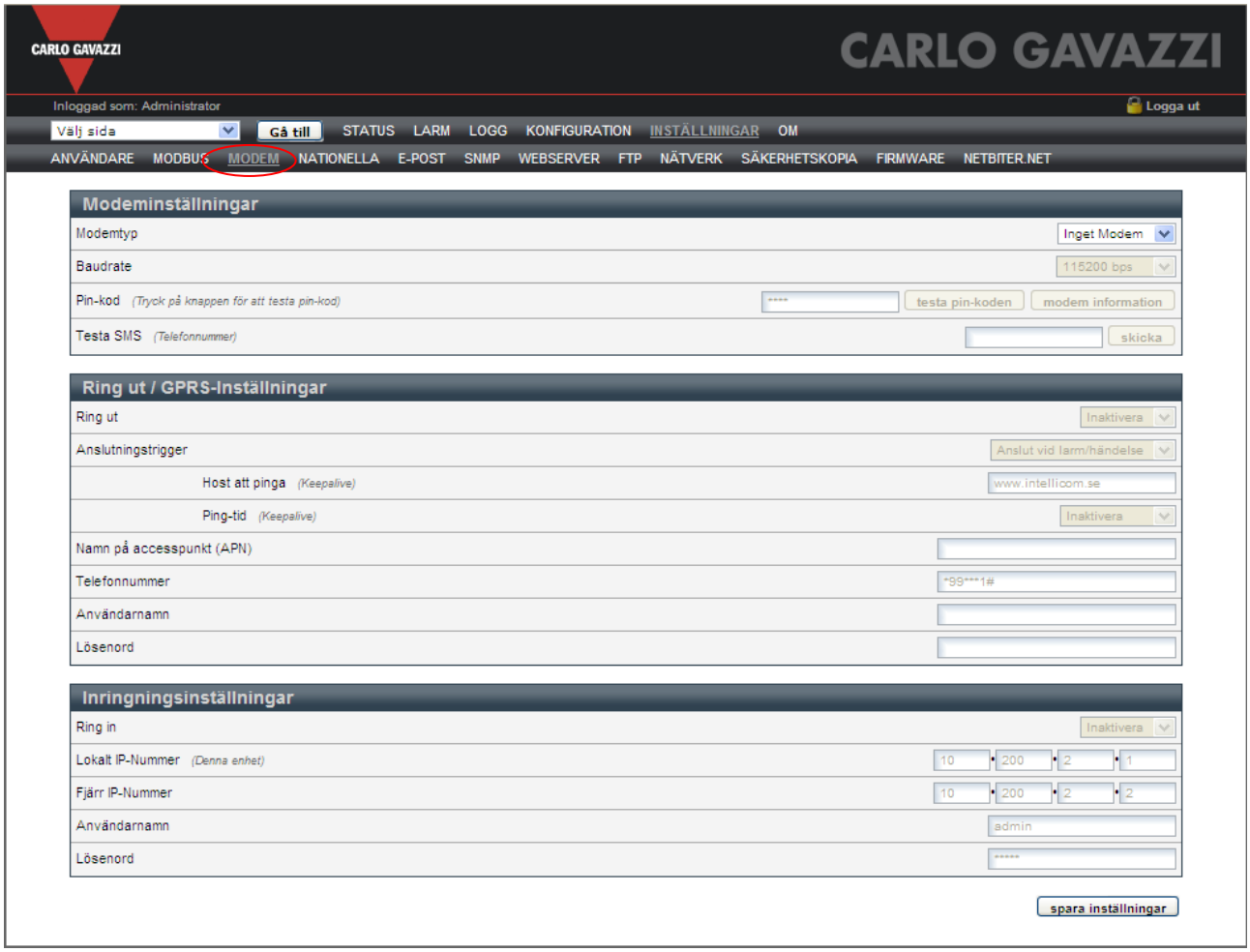
Valid Modbus commands for internal registers:

Command	Name
3	Read Holding Registers
6	Preset Single Register
16	Preset Multiple Registers

The internal registers are also available as an "internal template", i.e. the registers can be used on presentation pages and as alarms/log entries.

5.3 Modem settings

On this page you setup an external modem (optional) that can be either a GSM/GPRS modem or an analogue modem (PSTN).



5.3.1 Generic modem settings

Start with selecting the correct type of modem attached (GSM, Analogue, GPRS). Also set the desired baudrate that the DataLogger should connect to the modem with.

In this section you can also enter a PIN-code for the GSM-modem. Clicking on the "**modem info**" button will bring up a screen with some details about the modem (Signal strength etc).

5.3.2 Dial-up/GPRS settings

In this section you find configuration to allow the DataLogger to connect to Internet using a modem.

Connection trigger – Specifies whether the DataLogger should always be connected to Internet using the modem, or only connect when there is an alarm or event.

Host to ping – address to the Host that the DataLogger will ping when sending keep-alive messages for the GPRS connection.

Ping timer – Specifies the interval for the keep-alive messages. (Set value as high as possible to avoid unnecessary GPRS traffic).

Access Point Name (APN) – This is the gateway for all GPRS traffic. Contact your GSM/GPRS operator for information about this.

Phone number – Phone number to dial (e.g. to an Internet Service Provider, ISP).

User name – This is the user name your ISP has assigned to you.

Password – Password to log into the ISP network.

5.3.3 Dial-in settings

The dial-in functionality can be used when someone wants to view the web-pages in the DataLogger over a modem-link.

Local IP-number – This is the IP-number of the DataLogger, which the remote client will see when creating the PPP-connection.

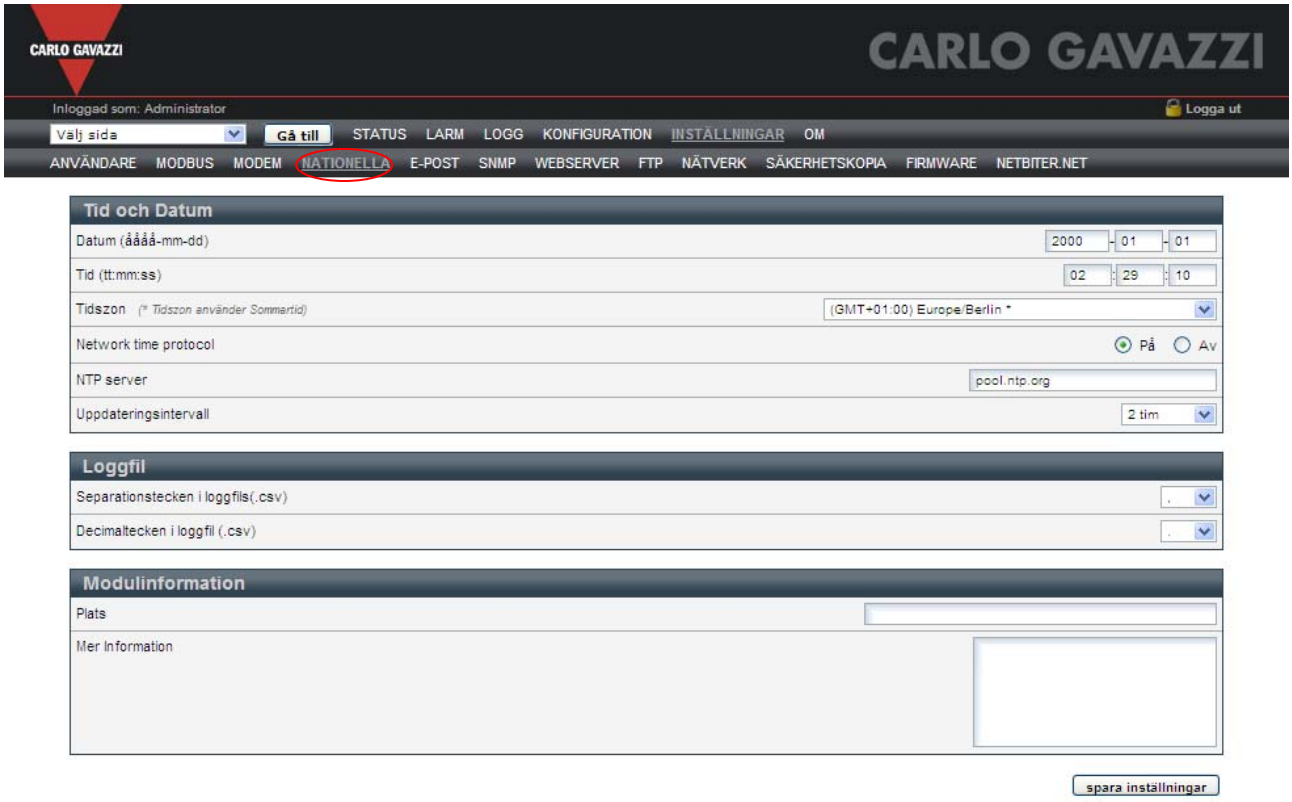
Remote IP-number – This is the IP-number that will be assigned to the remote client, when creating the PPP-connection.

User name – This is the login that the remote client will use when creating the PPP-connection.

Password - This is the password that the remote client will use when creating the PPP-connection.

5.4 Regional

The Regional page contains configuration for time and date, generic module information and also configuration for how the log file list separator and decimal symbol should be represented.



5.4.1 Time and date

This configures the real-time clock on the module. The clock will continue to work during power-loss
(max. 1 week). To use NTP (Network Time Protocol), enable it and enter an NTP-server (or use the default configuration). Also set the update interval (how often NTP will synchronise the time).

5.4.2 Log file

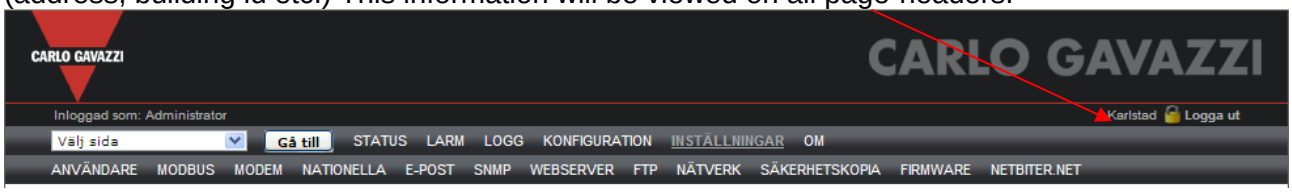
List separator - Can be either colon (,) or semi-colon (;).

Decimal Symbol – Can be either dot (.) or colon (,).

The list separator and decimal symbol should be selected so it matches the configuration on the computer where the file will be analysed.

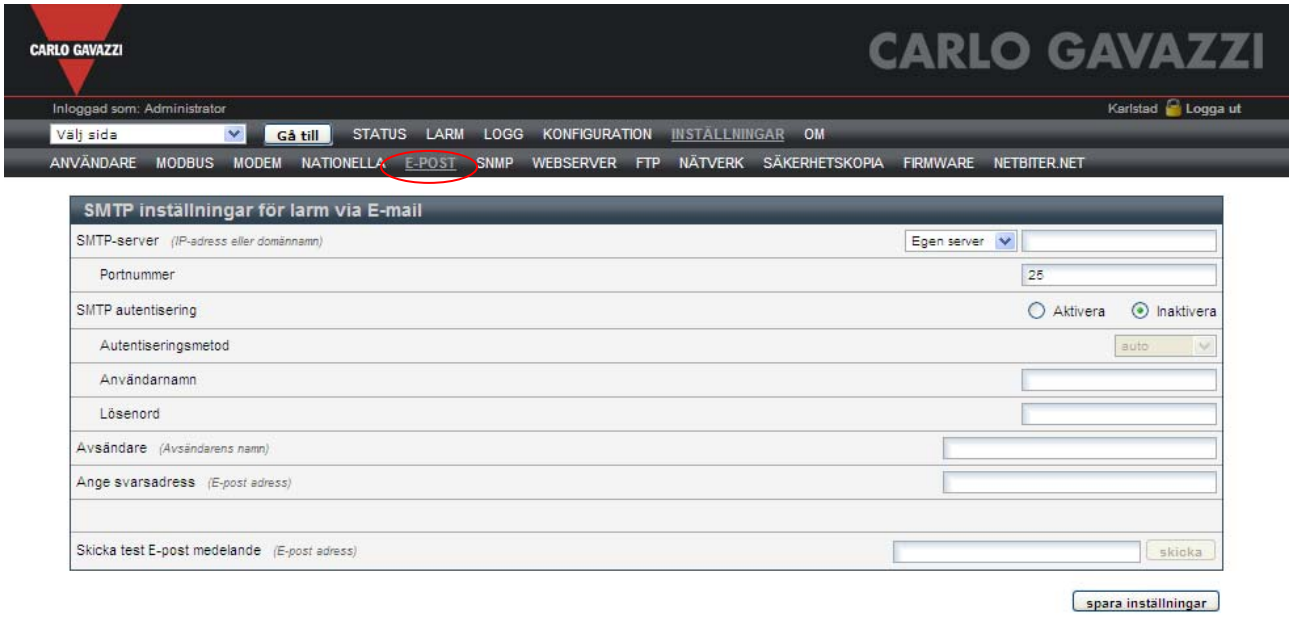
5.4.3 Module information

The “Location” string can be used to add information about where the module is located (address, building id etc.) This information will be viewed on all page-headers.



The “More information” field can be used to do notes about the installation.

5.5 Email Setup



The following configuration properties are available:

- **SMTP server** – IP-number or domain name to the SMTP server that the module should use when sending E-mails. If domain name is used make sure that you have entered a DNS under the Network configuration. You can choose to use the Netbiter.net server to forward emails. Simply click “Netbiter.net” and activate your Netbiter.net account, see section **Fel! Hittar inte referenskälla.** on page **Fel! Bokmärket är inte definierat.**.
  - Port number: The port that is used by the SMTP-server for incoming mail given by your Internet service provider. For custom servers this is set to port 25 as default. When using the Netbiter.net services it is set to port 2525.
- **SMTP Authentication**
  - Authentication method: Auto, plain, login or cram-MD5
  - User name
  - Password
- **Sender** – From field in the alarm mail. Example “SIU-DL”
- **Reply path** – The E-mail address to send a mail to when someone reply on an alarm mail.

5.5.1 SMTP Authentication

If the SMTP server require authentication you should enable SMTP Authentication. There are several types of authentication methods supported by the module:

- **auto** – The module automatically select the best method supported by the SMTP server.
- **plain** – a simple non-encrypted method supported by most SMTP servers.
- **login** – a simple non-encrypted method supported by most SMTP servers.
- **cram-md5** – a more secure login method where the user name and password is encrypted. (This method is not supported by all SMTP servers).
-

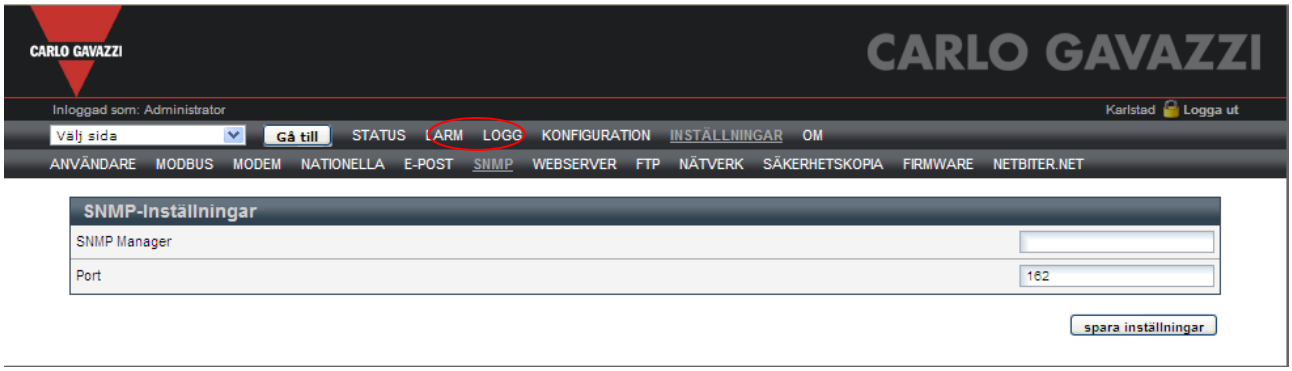
Note: auto will not work if only plain and login is supported by the SMTP server, because the module find these methods too insecure, in that case "login" or "plain" must be must be set explicit.

To verify the setup, use the Test E-mail functionality. Clicking on the "**send**" button will generate a test
e-mail.

5.6 SNMP Setup

The SNMP Setup page contains configuration to be able to send SNMP traps.

- **SNMP Manager** – The SNMP manager to which SNMP traps should be sent
- **Port** – The port number on the SNMP manager to which traps should be sent



If SNMP is activated for alarms, see section 4.5 on page 32, all alarms will be sent by using SNMP.

There is a MIB-file for SIU-DL DataLogger that can be downloaded from http://support.intellicom.se

5.7 Web-server Setup

The Web server Setup page contains a configuration to change the port number of the internal web-server in the DataLogger and also enable/disable the low bandwidth pages.

Extra webserver port - To connect to the Extra webserver port the URL should have a colon ':' followed by the new port number, i.e. http://10.10.10.30:8080 where 10.10.10.30 is the IP number or DNS address to the SIU-DL and :8080 the new port.

Compression on web pages – (Only used for the Extra webserver port) is used to improve the data transfer for low bandwidth connection, such as modem connection. The SIU-DL DataLogger will check if the connecting web browser support compressed data transfers, and then compress the web-pages before sending them.

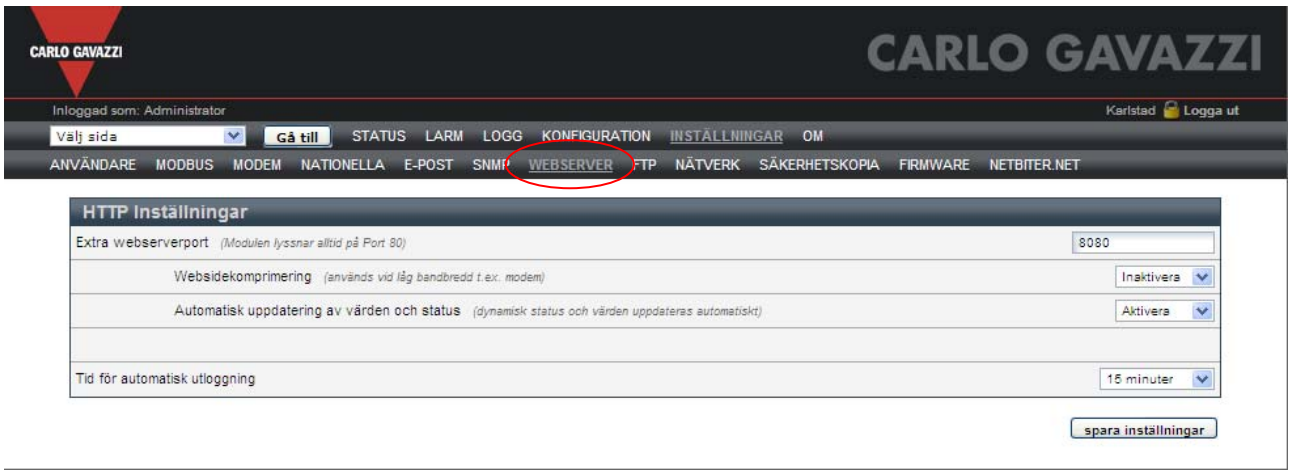
When compression is used the workload of the SIU-DL will increase, and that is why this feature is not enabled by default.

There is an option to '**disable**' compression and the pages will be sent as normal web pages, which always is the case for the standard web server port 80.

If it is set to '**force**' web pages will always sent compressed regardless the support of the web browser. In some cases the information if the web browser supports compressed data will be altered in the network route, as with Microsoft ISA server default setting for controlling port 80. To ensure that compressed web pages are sent anyway the option '**force**' is set. Most web-browsers supports compressed data.

Auto update values and status – (Only used for the Extra webserver port) to minimize the amount of data transferred over a connection with http compression. The data will be read only one time. To refresh values and status the refresh button at the upper left corner has to be clicked. If the web-browser reload button is used instead, unnecessary data-traffic will be generated.

Automatic logout time - defines the time-interval before a user is logged out from the web-server.

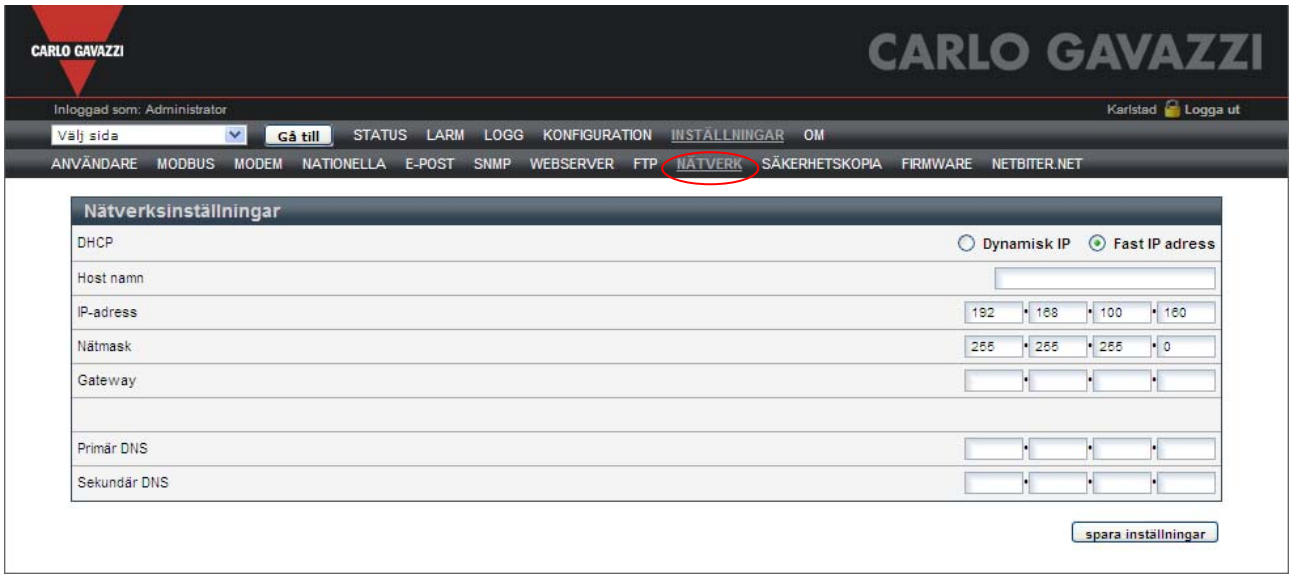


Note: The webserver will always listen on default port 80.

Note: When using modem connection, compression on web pages will always be enabled and Auto update will always be disabled to improve response time, and the refresh button has to be clicked to update values and status.

5.8 Ethernet (TCP/IP) settings

If you press the Configuration/Ethernet link you will be presented with the following view:



On this page you can view and change the TCP/IP network settings in the module. These settings are the same as the ones set by the SIU-DL Config utility.

Dynamic IP: Select this if you have a DHCP server on your network and you want the IP address be assigned automatically by the server.

DO NOT SELECT THE DYNAMIC IP OPTION IF YOU DON'T HAVE A DHCP SERVER AVAILABLE ON THE NETWORK.

Host Name: Here you can enter a hostname of your device (if E-mail alarms should be used this field must contain something)

IP Address: The IP address of the SIU-DL.

Netmask: The subnet mask

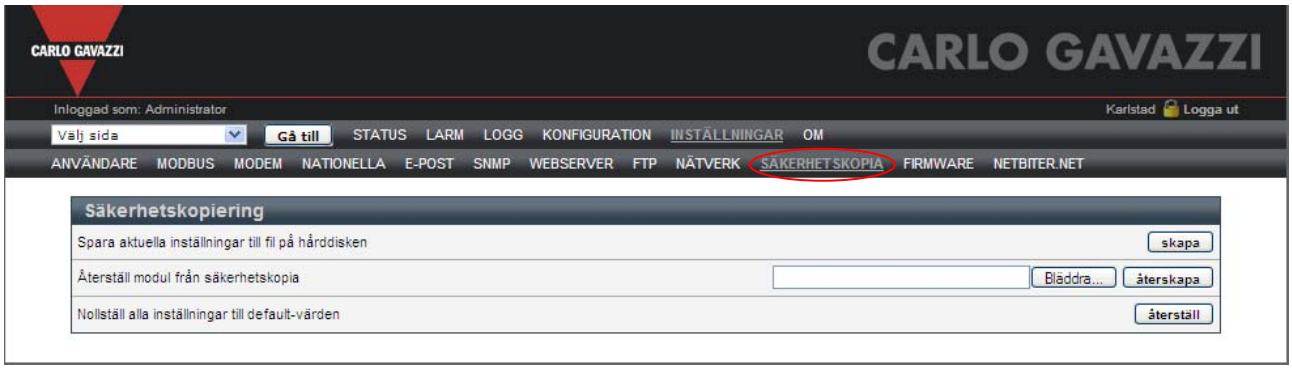
Gateway: The default gateway

Primary DNS: The primary Domain Name Server (**optional**)

Secondary DNS: The secondary Domain Name Server (**optional**)

5.9 Backup

The backup functionality makes it possible to backup and restore configurations.



By pressing the backup button you will get a backup file that can be stored locally.

All configurations in the Module except Ethernet settings will be in the backup.

To upload a backup to a module, press the Browse button and select an .nbb file, then press restore.
After restoring the configuration, you will be asked to restart the module.

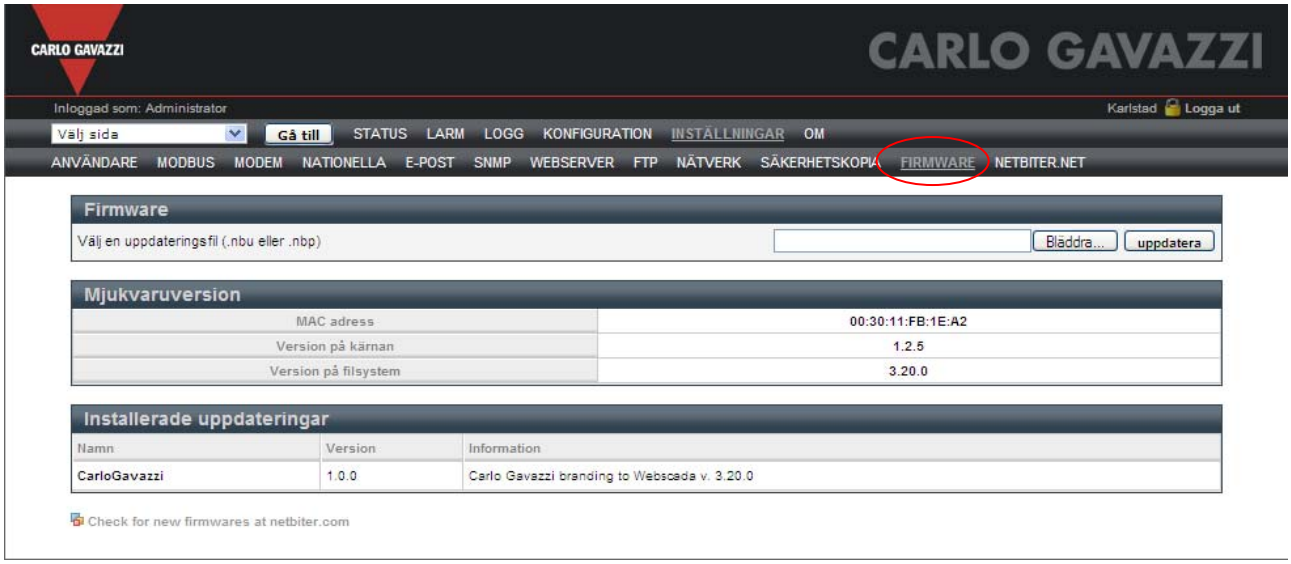
To bring a module back to Factory default configuration, click the "**reset**" button.

5.10 Firmware

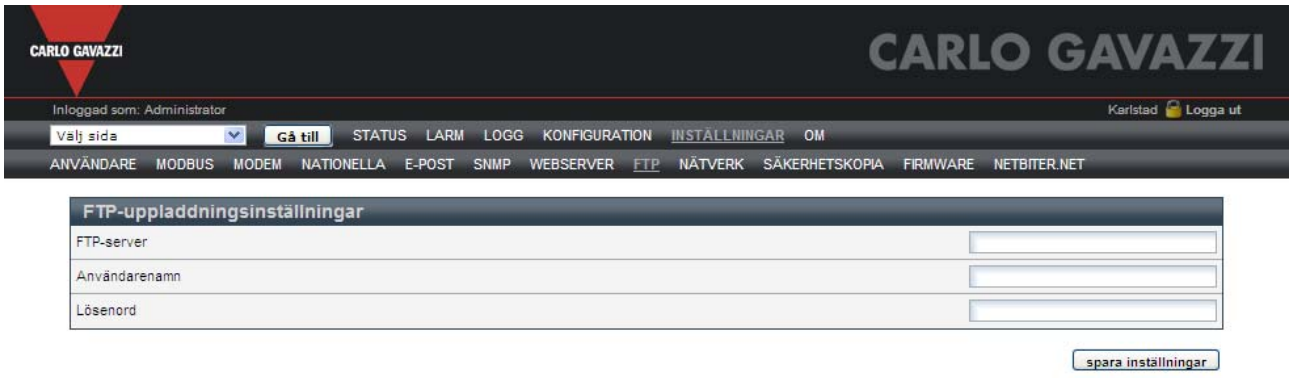
Firmware - On the firmware page it's possible to download a new firmware image (.nbu file) or a patch file (.nbp).

Software version – The MAC address for the module, the version of the kernel and the filesystem version is displayed in this section.

Installed updates – If there are any updates installed on the system, the name, version and description of the update will show here.



5.11 FTP



Files can be sent to a FTP server automatically. To use the Netbiter.net FTP server go to Setup/Netbiter.net. If Netbiter.net is enabled it will override the settings on this web page. More information about the Netbiter.net service can be found in section 5.11.

FTP-server - The server's IP address or DNS name

User name - The user name for the server.

Password - Password for the server.

5.12 Netbiter.net

Netbiter.net is a solution for remote management of SIU-DL® devices. This device is ready to connect to the Netbiter.net services using the Device ID and password that was shipped with the device.
More information about this service can be found in APPENDIX C: SNMP

If SNMP Alarms is enabled, see page 32, all alarms will be sent as SNMP traps to the host specified on the SNMP page, see section 5.6 on page 45.

The OID is sent in the following format in numbers:

.1.3.6.1.4.1.23312.1.1.2 [IP address][event]

.1.3.6.1.4.1.23312.1.1.[trap_id][trap_data]

where.

23312 is Intellicom enterprise ID

1.1 is products SIU-DL DataLogger

and where event:

1 = Alarm set

2 = Alarm cleared

A trap id is divided into five messages with following trap data:

#1 Alarm ID

#2 Alarm description

#3 Class ID (1-10)

#4 Class description

#5 Alarm severity, where

0 = indeterminate

1 = critical

2 = major

3 = minor

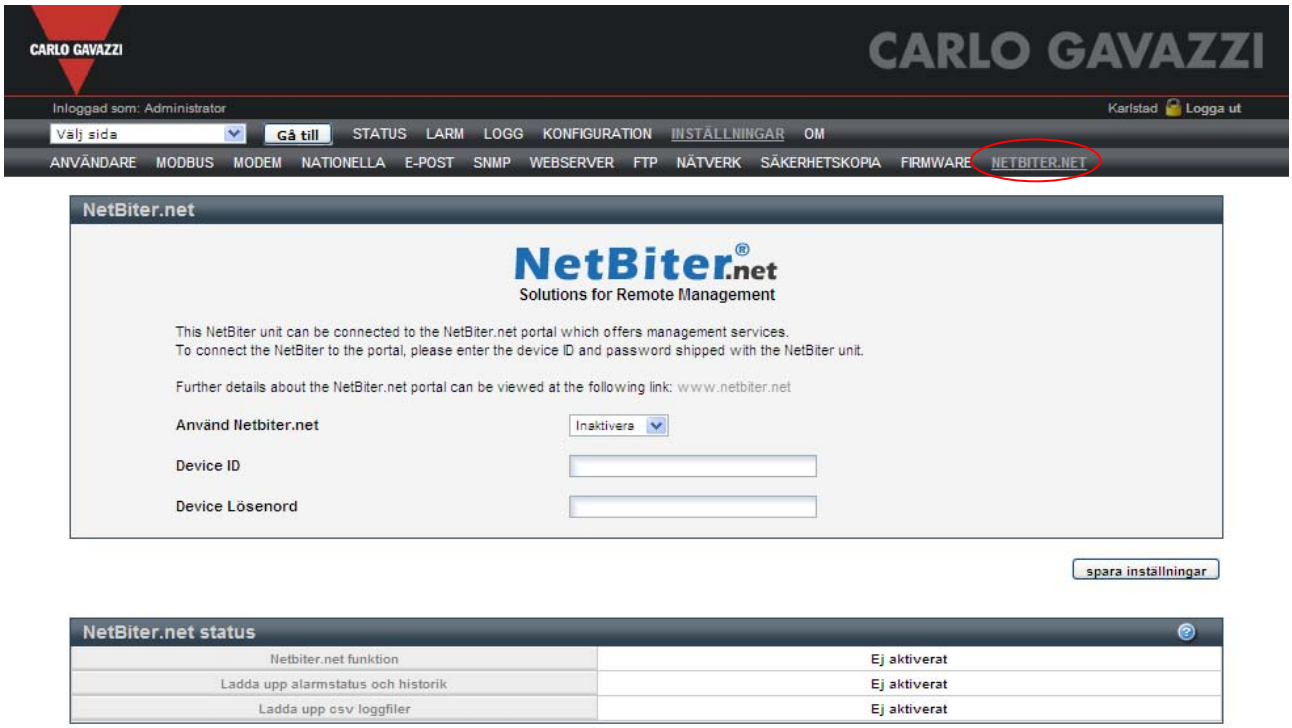
4 = warning

5 = cleared

See the pictures for example of SNMP trap sent an alarm to warning of high temperature from a SIU-DL.

To try out the SNMP functionality the software Trap Receiver could be used. This program can be found at http://www.trapreceiver.com. Please, check the license for the software. It could be used to examine a trap sent to a PC to better understand the SNMP functionality of the SIU-DL DataLogger.

APPENDIX D: Netbiter.net.



Enable Netbiter.net Service – Select if you would like to enable or disable this service.

Device ID – The Device ID received with the SIU-DL.

Device Password – The password received with the SIU-DL.

Upload alarm status and history – Indicates if the service is activated at the Configuration/Alarm page, see 4.5 on page 32.

Upload csv Log files – Indicates if the upload log files has been set at the Configuration/Log page, see 4.6 on page 34.

Mail server and FTP server will automatically be set to use Netbiter.net services, with correct Device ID and Device password.

Some Internet Service Providers, ISP, has blocked the connection to the mail server other than their own mail server. In these cases use the mail server provided from your ISP by setting a custom server and enter login and password that is sent to you by your ISP.

APPENDIX A: Specifications

Ethernet connection

10Base-T or 100Base-TX (IEEE 802.3). RJ45 connector.

Serial interfaces

RS-232 with full modem control (RTS,CTS,DCD,DTR,DSR,RI)
300-115.200bps, 9-pole DSUB connector

RS-485, 300-115.200bps, screw connector.

Power Supply

9-28VAC/DC (2W)

Temperature range

Operating : - 40 – 85 °C
Storage : -25 – 85 °C

Humidity range

5-95% RH, non-condensing

Cover material

Grey plastic, LEXAN 940, self-extinguishing acc. to UL94-V0

Mounting option

DIN rail (EN 50022)

CE certification
According to EN 61 000-6-4 and EN 61 000-6-2:2001

APPENDIX B: Internal registers

Holding register	Name	Values	Options	Comment
1	Digital input 1 status	0 or 1		Read only
2	Digital input 2 status	0 or 1		Read only
3	Number Active Connections MB/TCP	0-10		Read only
4	Number Active Internal Connections	0-10		Read only
	Serial Status (Modbus/TCP)			See section (3.3)
5	Valid responses	0-65535		Can be cleared
6	Serial timeouts	0-65535		Can be cleared
7	CRC errors	0-65535		Can be cleared
8	Input Buffer overruns	0-65535		Can be cleared
9	Frame errors	0-65535		Can be cleared
10	Exception responses	0-65535		Can be cleared
	Serial Status (Buffered messages)			
11	Valid responses	0-65535		Can be cleared
12	Serial timeouts	0-65535		Can be cleared
13	CRC errors	0-65535		Can be cleared
14	Input Buffer overruns	0-65535		Can be cleared
15	Frame errors	0-65535		Can be cleared
16	Exception responses	0-65535		Can be cleared
	Serial Status (Internal requests and Webpages)			
17	Valid responses	0-65535		Can be cleared
18	Serial timeouts	0-65535		Can be cleared
19	CRC errors	0-65535		Can be cleared
20	Input Buffer overruns	0-65535		Can be cleared
21	Frame errors	0-65535		Can be cleared
22	Exception responses	0-65535		Can be cleared
	Configuration Registers			
23	Modbus/TCP Port	1-65535		Default port number is 502
24	Gateway Modbus address	(-1)-255		
		-1	Disabled	Default
		0 - 255	Enabled	
25	Modbus/TCP idle timeout	0-65535 (seconds)		Default 60 seconds
		0	Disabled	
		1 - 65525	Enabled	
26	Baudrate			
		2400	2400 bps.	
		4800	4800 bps.	
		9600	9600 bps.	Default value

Holding register	Name	Values	Options	Comment
		19200	19200 bps.	
		38400	38400 bps.	
		57600	57600 bps.	
		115200	115200 bps.	
27	Parity	0-2		
		0	No parity	Default
		1	Even parity	
		2	Odd parity	
28	Number of Stop bits	1-2		Default 1 stop bit
29	Slave timeout time	25-65535 (milliseconds)		Default 1000 ms.
30	Physical interface	0-2		
		0	EIA-485 (RJ12)	Default
		1	EIA-232 (DSUB)	
		2	EIA-232 (RJ12)	
	Authentication			
31	Valid IP address 1	0-255		First byte of IP address
		0	Disabled	IP address auth disabled
		1-255	Enabled	
32	Valid IP address 2	0-255	Enabled	Second byte of IP address
33	Valid IP address 3	0-255	Enabled	Third byte of IP address
34	Valid IP address 4	0-255	Enabled	Fourth byte of IP address
35	Mask for Valid IP address 1	0-255	Enabled	First byte of mask
36	Mask for Valid IP address 2	0-255	Enabled	Second byte of mask
37	Mask for Valid IP address 3	0-255	Enabled	Third byte of mask
38	Mask for Valid IP address 4	0-255	Enabled	Fourth byte of mask

APPENDIX C: SNMP

If SNMP Alarms is enabled, see page 32, all alarms will be sent as SNMP traps to the host specified on the SNMP page, see section 5.6 on page 45.

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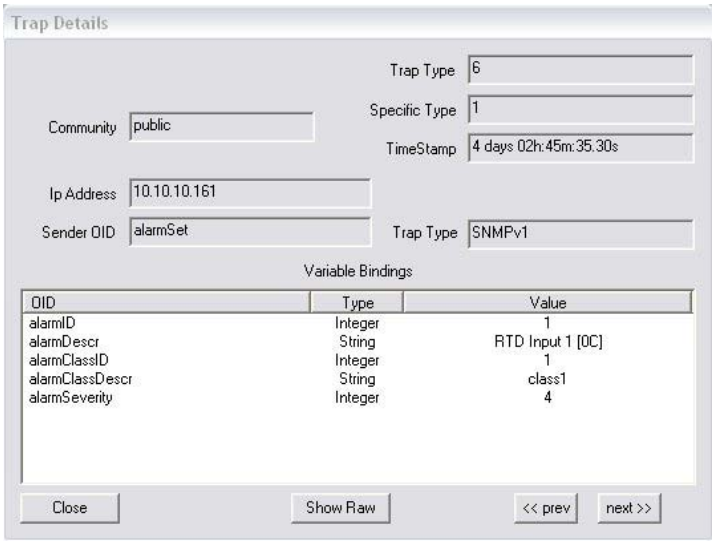
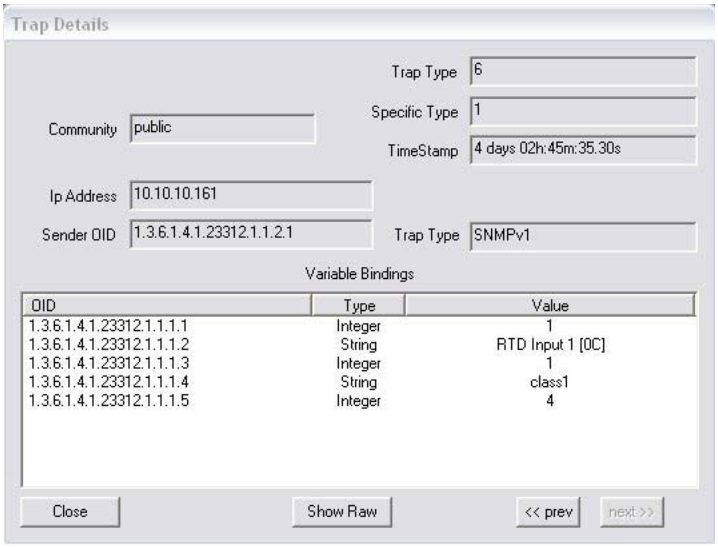
To try out the SNMP functionality the software Trap Receiver could be used. This program can be found at http://www.trapreceiver.com. Please, check the license for the software. It could be used to examine a trap sent to a PC to better understand the SNMP functionality of the SIU-DL DataLogger.





APPENDIX D: Netbiter.net

The web site www.Netbiter.net collects and stores data from remote equipment. Through the central server an authorized user can access the information at any time and from any location. This is a free service from IntelliCom that gives customers to the SIU-DL DataLogger unique possibilities.

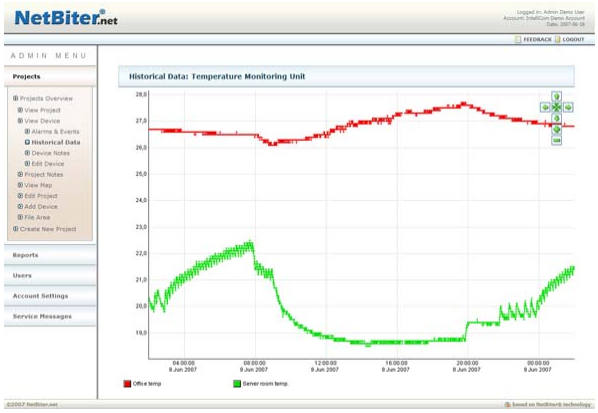
The SIU-DL DataLogger devices connect to the central server to submit critical equipment data, such as logged parameter data and alarms. At the server an authorized user can view and manage this information. The only tool the user needs is a standard web browser. The use of one central location for all remote equipment simplifies the work for anyone dealing with remote installations.

The Netbiter.net service provides the following functions:

- Administrate and maintain users, projects, remote field units and data.
- Storage of log files produced and sent by the SIU-DL DataLogger field units.
- View logged data as trend graphs.
- Management of active alarms and alarm history (alarm notifications updates automatically on the server).
- View the physical location of remote equipment on a map.
- Etc

This service from IntelliCom is free!

Netbiter.net features

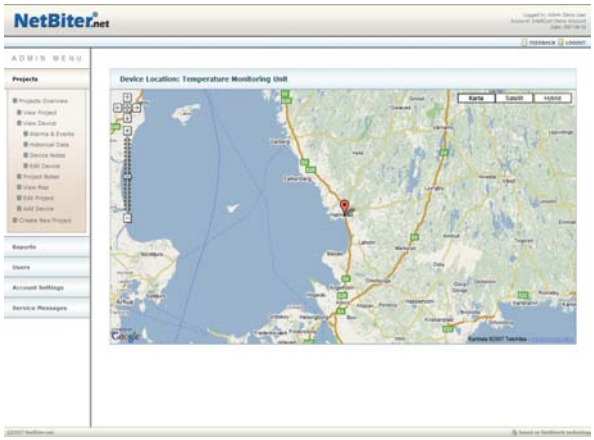


Trending

Store data log files at Netbiter.net and view trend graphs of selected parameter data.

Analyze trends to detect early warning of malfunctioning equipment.

To be proactive to problems saves time and money immediately as travels to sites can be dramatically reduced.



Positioning

View the location of remote equipment on a map.

Easy and improved planning of service routes saves time for any service organization.

When an alarm occurs in equipment, that unit in the map will automatically be marked in red colour.

Management of users, projects…

One central place for management of users, remote equipment and critical information.

Store important blue prints, pictures, templates and more.

Getting Started

To get started with Netbiter.net you need to have a SIU-DL with Netbiter.net Device ID, which is found in the package.

Setup the SIU-DL device as it is described in section **Fel! Hittar inte referenskälla.** on page **Fel! Bokmärket är inte definierat.**.

Continue with creating an account on the Netbiter.net server by following these steps:

1. Go to www.Netbiter.net
2. If you do not have an account for Netbiter.net you have to create one, otherwise go to step 6.
3. At the lower left corner at the login screen click “**create account**”.
4. Enter registration data and read the terms and condition. Click register when ready
5. The e-mail address entered in the registration process will get an e-mail with an activation key. Just click the URL to activate you Netbiter.net account.
6. Go to www.Netbiter.net and login using the user name and login.
7. Click Projects and create new project. Enter required information. Click “**next**” when ready
8. Enter the Device ID and password that was sipped with the device, and select a name for the device. Enter additional information, when ready click “**save**”.

Now the system is up and running.